The normative development of emotion regulation strategy use in children and adolescents: a 2-year follow-up study

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Background: Emotion regulation involves intrinsic and extrinsic processes responsible for managing one's emotions toward goal accomplishment. Research on emotion regulation has predominantly focused on early developmental periods and the majority of emotion regulation research examining the pre-adult years has lacked a comprehensive theoretical framework. The current study examined the use of two strategies of emotion regulation during childhood and adolescents, as conceptualised within Gross's (1998) process-oriented model. **Methods:** To determine the use, norms and development of the Expressive Suppression and Cognitive Reappraisal strategies, the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) was administered to 1,128 participants aged between 9 and 15 years. Three data collection phases, each one year apart, enabled investigation of developmental patterns in the use of the two strategies. **Results:** As predicted, Suppression use was found to be lower for older participants compared to their younger peers, and over time participants reported less use of this strategy. Older participants also scored lower on Reappraisal but stability over time was found. Also as expected, males reported more Suppression use compared to females. **Conclusions:** By documenting the development and norms for Cognitive Reappraisal and Expressive Suppression in a community sample of children and adolescents, the current study makes a significant contribution to our understanding of these two ER strategies during these developmental periods. **Keywords:** Emotion regulation, children, adolescents, normative development, longitudinal. **Abbreviations:** ER: emotion regulation; ERQ-CA: Emotion Regulation Questionnaire for Children and Adolescents.

Over the past two decades, there has been increased recognition of the importance, for children's healthy psychological development, of learning how to manage or regulate emotions in a socially appropriate and adaptive manner (Cole, Michel, & Teti, 1994; Morris, Silk, Steinberg, Myers, & Robinson, 2007; Southam-Gerow & Kendall, 2002). There is general consensus that ER involves intrinsic and extrinsic processes responsible for managing one's emotions toward goal accomplishment (Thompson, 1994). ER processes can be conscious or unconscious, automatic or effortful (Cole et al., 1994; Gross & Thompson, 2007; Thompson, 1994) and include skills and strategies for monitoring, evaluating, and modifying emotional reactions. ER involves not only reducing the intensity or frequency of emotional states but also the capacity to generate and sustain emotions (Cole et al., 1994; Calkins & Hill, 2007). Moreover, ER processes are not solely focused on negative emotions but include positive emotion regulation (Gross & Thompson, 2007).

Developmental research on ER has predominantly focused on the periods of infancy and early childhood (Eisenberg, Champion, & Ma, 2004; Thompson, 1994), a time when temperamental, maturational and social forces unite in laying a foundation for individual differences observed later in life and for the development of ER. During these early years, there are important developmental changes in children's understanding of emotions, including an ability to analyse emotion-generating situations in greater detail, an appreciation of causes, consequences and different ways of expressing emotions, as well as an appreciation of cognitive appraisals of emotions (Stegge & Meerum Terwogt, 2007).

A small number of studies have examined ER during later childhood (e.g., Penza-Clyve & Zeman, 2002; Suveg & Zeman, 2004) but have primarily been conducted in the absence of a comprehensive theoretical framework, contributing to criticisms that 'the field has struggled in its efforts to move forward…' (Cole et al., 2004, p. 330). An exception, albeit relating to adult research, is the work relating to Gross's (1998) process-oriented approach. This comprehensive and detailed model has received much empirical attention in the adult years and includes five sets of emotion regulatory strategies: (i) situation selection, (ii) situation modification, (iii) attention deployment, (iv) cognitive change, and (v) response modulation. Specific ER strategies have been differentiated as *antecedent-focused* or *response-focused*, along timelines consistent with an unfolding emotional response. The former refers to strategies adopted before the emotion-response tendencies have become fully activated and the latter to those adopted once an emotion is already being experienced.

Conflict of interest statement: No conflicts declared.

Of the many possible strategies employed for ER management, to date only two have been operationalised within Gross's process model. They are (i) *Cognitive Reappraisal* – a cognitive change strategy that involves redefining a potentially emotion-eliciting situation in such a way that its emotional impact is changed; and (ii) *Expressive Suppression*, a form of response modulation involving the inhibition of ongoing emotion-expressive behaviour. These strategies have been the focus of ER research within the Gross (1998) model framework for a number of reasons, including that each is a good exemplar of antecedent-focused and response-focused strategies, respectively, and both are strategies that are commonly used in everyday life (John & Gross, 2004).

Based on a research with young adults, Gross and John (2003) reported that individuals differ in their use of Cognitive Reappraisal and Expressive Suppression, and that these differences relate in predictable ways to psychological functioning. Specifically, Reappraisers are more likely to negotiate stressful events by interpreting them in a more optimistic way, and to be more active in their attempts to repair negative moods. Consequently, they experience and express more positive affect and less negative affect more frequently compared to people who use this strategy less often. More frequent use of Expressive Suppression is associated with considerable psychological cost. Suppressors express and experience less positive affect, and are less successful than non-Suppressors at mood repair. Furthermore, whereas suppressing negative emotions has been shown to leave the experience of negative emotions intact, suppressing positive emotions decreases the experience of positive emotions.

John and Gross (2004) have also reported that Reappraisal has a healthier profile with regard to short-term affective, cognitive and social outcomes when compared to Suppression. In contrast, Suppression was associated with greater physiological and cognitive costs (e.g., Srivastava, Tamir, McGonigal, John, & Gross, 2009). Gross and John (2003) also found that men use Suppression to a greater degree than women but no sex difference was found in the use of Reappraisal.

Of note, the use and development of these two ER strategies has not been researched during periods of development prior to the early adult years (John & Gross, 2004). Thus, 'Despite richly overlapping concerns, to date there has been a surprising lack of integration across the developmental and adult literatures on emotion regulation' (Gross & Thompson, 2007, p. 7). The primary aim of this paper was to investigate the use, norms and development of Expressive Suppression and Cognitive Reappraisal ER strategies in 9- to 15-year-old children and adolescents. Follow-up over two years enabled determination of the continuity/discontinuity of ER strategy use over time. Given speculation that over

time, with increasing age and experience about the costs and benefits of using different ER strategies, individuals learn to regulate their emotions in healthier ways (John & Gross, 2004), it was predicted that the use of Expressive Suppression would be lower for older participants compared to their younger peers and that over time participants would report less use of this strategy. The converse was expected for Cognitive Reappraisal use. Further, it has been noted that over time strategy use becomes more trait-like (Cole et al., 1994). Thus, change over time was expected to be less marked for older compared to younger individuals. Enabling examination of developmental patterns to extend beyond adolescence, comparisons included data from Gross and John's (2003) young adult sample. A secondary aim was to investigate sex differences during these developmental periods. Consistent with Gross and John's (2003) findings, it was expected that boys would score higher than girls on Expressive Suppression but that no differences would be found on Cognitive Reappraisal.

Method

Participants

The sample for the current study ($n = 1,128$) was drawn from a larger study of children and adolescents recruited from 15 primary schools and 9 secondary schools in metropolitan Melbourne, Australia ($N = 1,392$). As part of the larger study examining the development of the self-conscious emotions of shame and guilt and relationships with psychological wellbeing, participants were assessed at three time points, referred to as T1, T2, and T3, each approximately one year apart (T1–T2 interval: $M = 1.1$, $SD = .1$; T2–T3 interval: $M = 1.1$, $SD = .2$). At T1, the approximate response rate was 80%, determined by the number of consent forms returned on which parents consented to their child's participation compared to those returned on which parents refused their child's participation. The retention rates were 84% ($n = 1,174$) at T2 and 77% ($n = 1,073$) at T3.

For the current study, participants who were outside the targeted age range at T1 (9–15 years; $n = 7$) or had less than two points of data ($n = 100$) were excluded. The distribution of the resulting sample by major region of birth indicated an over-representation of participants born outside Australia. Thus, an ethnically representative sample was obtained by including all Australian-born participants ($n = 1,013$) and then randomly selecting participants from other regions of birth until the distribution conformed closely to that of children and adolescents in the wider population of Melbourne (Australian Bureau of Statistics (ABS)), 2008. The final sample comprised 1,128 participants (44% male; M age = 12.08 years, $SD = 1.58$; 90.6% born in Australia). Most participants ($n = 829$) were assessed at all three time points, 190 at T1 and T2 only, and 109 at T1 and T3 only. Information was also obtained regarding parental employment and occupation. Of parents reporting to be in paid employment (73%), the distribution of occupations (Australian Standard Classifica-

tion of Occupations; ABS, 1996) conformed closely to that reported for the wider population of Melbourne (ABS, 2008). Two-tailed t-test comparisons between those included in the current sample and those not included indicated no differences on T1 Reappraisal [$t(1385)$ = .95, p > .05] or Suppression scores [$t(1385)$ = –1.58, p > .05].

Measures

Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA). The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) comprises 10 items assessing the ER strategies of Cognitive Reappraisal (6 items) and Expressive Suppression (4 items). Items are rated on a 7-point Likert-type response scale. Higher scores on each scale indicate greater use of the corresponding ER strategy. The ERQ has been reported to have high internal consistency (α = .79 Reappraisal, .73 Suppression) and three-month test–retest reliability (r = .69 for both scales), as well as sound convergent and discriminant validity with both younger and older adults (Gross & John, 2003; John & Gross, 2004).

A revised version of the ERQ (i.e., the ERQ for Children and Adolescents: ERQ-CA) was used in the current study (MacDermott, Betts, Gullone, & Allen, 2009) to optimise completion by the non-adult sample. Revisions included simplification of the item wording (e.g., 'I control my emotions by not expressing them' was reworded to 'I control my feelings by not showing them') and reduction of the response scale length to 5 points (1 = strongly disagree, 2 = disagree, 3 = half and half, 4 = agree, 5 = strongly agree). Example Suppression scale items include 'I keep my feelings to myself' and 'When I am happy, I am careful not to show it'. Example Reappraisal items include 'When I want to feel happier, I think about something different' and 'When I want to feel happier about something, I change the way I'm thinking about it'. The range of scores for each scale is 6 to 30 (Reappraisal) and 4 to 20 (Suppression).

Psychometric analysis of the ERQ-CA in a sample of 1,745 children and adolescents aged 9– 16 years demonstrated good internal consistency (α = .81 Reappraisal, .69 Suppression) and adequate four-week test–retest reliability (r = .54 Reappraisal, .59 Suppression;

MacDermott et al., 2009). Confirmatory factor analysis reproduced the two factors proposed by Gross and John (2003). Validity has been demonstrated through correlations in the expected directions between the two ER scales and measures of temperament, shame, guilt and empathy, as well as parental warmth and overprotection (Betts, Gullone, & Allen, 2009; Jaffe, Gullone, & Hughes, 2009; MacDermott et al., 2009). In the current study, internal consistency coefficients were .80, .82 and .82 (Reappraisal) and .67, .72 and .73 (Suppression) at T1, T2 and T3, respectively.

Procedure

The study was approved by the institutional ethics committee, state Department of Education, and Catholic Education Office. Explanatory statements and consent forms were distributed by the researchers to children at school, to be given to their parents. Completed parental consent forms were returned to school by the children. At T1 all children with parental consent completed written questionnaires in small groups at school under the supervision of the researchers and a class teacher. The questionnaires were administered in counterbalanced order at all time-points.

Results

Below we report latent growth curve modelling (LGC) to test the study hypotheses. Cross-sectional age comparison analyses were also carried out, including Gross and John's (2003) young adult sample. The data were screened for invalid and missing data. Missing items were imputed for the Reappraisal scale using expectation maximisation when no more than one item was missing. Missing data were not imputed for the Suppression scale due to the small number of items. Means and standard deviations for each strategy by time-point, age and sex are shown in Table 1. Intercorrelations over time ranged from r = .28 (for T1 with T3) to .42 (for T2 with T3) for Reappraisal and r = .35 (for T1 with T3) to .50 (for T2 with T3) for Suppression (all p < .001).

Table 1 Means and standard deviations for cognitive reappraisal and expressive suppression use by age and sex

	n (T1)	Reappraisal *M(SD)*			Suppression *M(SD)*		
		T1	T2	T3	T1	T2	T3
T1 age							
9 years	118	20.84 (3.86)	21.70 (4.04)	20.94 (3.37)	11.69 (2.83)	11.34 (3.30)	10.63 (3.00)
10 years	206	21.53 (4.11)	21.51 (3.80)	21.06 (3.88)	11.44 (3.14)	10.77 (3.05)	10.86 (2.90)
11 years	252	21.67 (4.22)	21.30 (3.96)	20.72 (3.88)	11.58 (3.24)	10.91 (3.04)	10.58 (3.24)
12 years	212	20.69 (4.67)	20.88 (3.88)	21.11 (3.92)	10.56 (2.99)	10.78 (2.90)	10.58 (2.80)
13 years	180	19.92 (3.86)	20.54 (3.61)	20.57 (3.63)	10.28 (2.87)	10.06 (2.84)	9.95 (2.68)
14 years	129	20.07 (3.94)	20.09 (4.24)	20.53 (3.86)	10.09 (3.34)	10.75 (3.14)	10.57 (3.27)
15 years	31	21.48 (3.12)	20.93 (3.31)	21.10 (3.55)	10.35 (3.43)	9.14 (2.89)	9.65 (3.34)
Sex							
Male	498	20.68 (4.36)	20.84 (3.95)	20.84 (3.79)	11.54 (3.10)	11.51 (2.83)	11.09 (3.02)
Female	630	21.09 (4.03)	21.20 (3.87)	20.86 (3.78)	10.50 (3.11)	10.05 (3.06)	10.08 (2.90)
Total	1,128	20.91 (4.18)	21.04 (3.91)	20.85 (3.78)	10.96 (3.15)	10.71 (3.04)	10.51 (2.99)

Latent growth curve modelling (LGC) was used to test the study hypotheses using Amos Version 17.0 with maximum likelihood estimation. For both Reappraisal and Suppression, self-reports at T1, T2 and T3 were used to estimate two latent factors (intercept and slope). The intercept represents the initial level of strategy use while the slope represents the rate of change in reported strategy use over time. A linear measurement, or unconditional, model was tested for each strategy first to assess the shape of the growth curve (i.e., without any predictors). Second, a multivariate prediction, or conditional, model tested the utility of sex, age at T1, and the interaction between sex and age at T1 in predicting growth curve patterns. Sex was dummy coded (Female = 0, Male = 1), age at T1 was mean centred, and the interaction term calculated as the product of these two variables. In addition to the χ^2 test, minimal requirements for adequate SEM model fit were: root mean square error of approximation (RMSEA) less than .08 (.05–.08 reasonable fit, $\leq$ .05 good fit; Browne & Cudeck, 1993) and comparative fit index (CFI) and Tucker-Lewis index (TLI) values greater than .90 ($\geq$ .90 reasonable fit, $\geq$ .95 good fit; Hu & Bentler, 1998). Figure 1 illustrates the prediction model for Suppression use.

Reappraisal

The measurement model for Reappraisal did not fit the data well [$\chi^2(3)$ = 27.33, $p < .001$ RMSEA = .085;
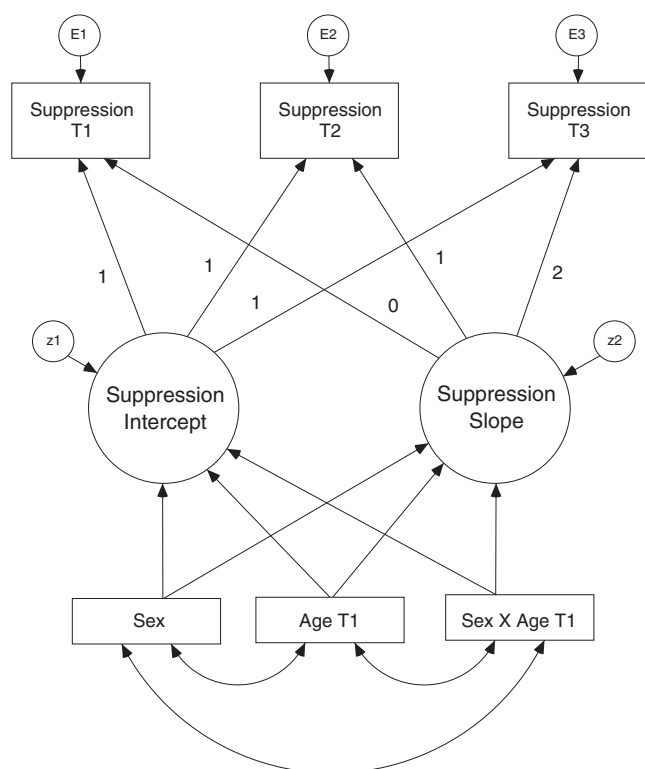

Figure 1 Hypothesised latent growth curve model depicting associations between age and sex and the intercept and slope of Suppression use

CFI = .914; TLI = .829]. Examination of modification indices resulted in the addition of correlated error terms between T1 and T2, and between T2 and T3 Reappraisal. This was theoretically acceptable given expected correlations in measurement error over time and the relative stability observed in mean Reappraisal scores over time. This modified model demonstrated good fit [$\chi^2(1)$ = 2.12, $p > .05$; RMSEA = .032; CFI = .996; TLI = .976]. The intercept mean (20.97, $SE = .12$) and variance (7.39, $SE = 1.85$) were significant ($p < .001$), indicating that mean Reappraisal use was 20.97 at T1 and that there was significant individual variability in Reappraisal use at T1. The slope mean (–.06, $SE = .08$) and intercept (.69, $SE = .78$) were not significant ($p > .05$), indicating that Reappraisal was relatively stable over time and that there was little individual variability in change over time.

Owing to the non-significant results for the Reappraisal slope, the prediction model was tested for the Reappraisal intercept only. This model showed good model fit $\chi^2(10)$ = 24.20, $p < .01$; RMSEA = .035; CFI = .984; TLI = .967]. As shown in Table 2, there were significant effects for sex and age at T1, with less use of Reappraisal reported by males and older participants at T1. There was no significant interaction effect between sex and age. The model explained 4% of the variance in Reappraisal intercept.

Suppression

The measurement model for Suppression showed good model fit [$\chi^2(3)$ = 11.12, $p < .05$; RMSEA = .049; CFI = .983; TLI = .966]. The intercept mean (10.96, $SE = .09$) and variance (5.24, $SE = .18$) were significant ($p < .001$) indicating that mean Suppression use was 10.96 at T1 and that there was significant individual variability in Suppression use at T1. The slope mean (–.22, $SE = .06$) and variance (.78, $SE = .18$) were also significant ($p < .001$) indicating that Suppression use decreased significantly over time and that there was significant individual variability in change over time.

The prediction model for Suppression use showed adequate model fit [$\chi^2(7)$ = 31.54, $p < .001$; RMSEA = .056; CFI = .979; TLI = .938]. As shown in Table 2, for the Suppression intercept, there were significant effects for sex and age at T1, with less use of Suppression reported by females and older participants at T1. There was no significant interaction effect for the Suppression intercept. For the Suppression slope, there was no significant effect for sex; however, there was a significant effect of age at T1, indicating that there was a smaller decrease in Suppression use over time for older participants. There was also a significant interaction between sex and age at T1. The interaction effect is illustrated in Figure 2, which shows that for males, the decrease in Suppression use over time differed little with age. In contrast, for females there was a smaller decrease

Table 2 Prediction models for reappraisal and suppression use

	Intercept			Slope		
Model	Standardised	Unstandardised	SE	Standardised	Unstandardised	SE
Reappraisal						
Sex	−.08	−.36*	.18	−	−	−
Age at T1	−.22	−.30***	.07	−	−	−
Sex × Age at T1	.06	.13	.12	−	−	−
Suppression						
Sex	.27	1.10***	.17	.02	.02	.11
Age at T1	−.29	−.37***	.07	.63	.20***	.04
Sex × Age at T1	.06	.13	.11	−.41	−.20**	.07

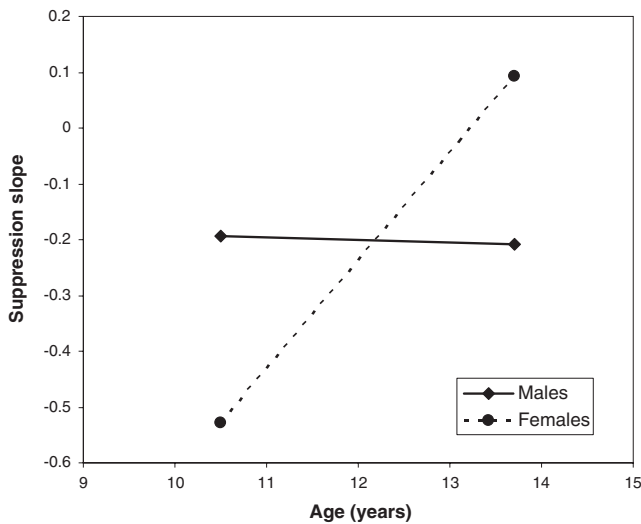*Note:* *p < .05, **p < .01, ***p < .001.

Figure 2 Interaction between sex and age at T1 on Suppression use slope. Slopes were calculated for males and females aged 1 SD above and below mean age at T1

in Suppression use over time for older compared to younger participants. The model explained 15% of the variance in Suppression intercept and 23% of variance in Suppression slope.

Comparison of adolescents and young adults

Based on age at T1, the early to mid-adolescent (13–15 years) sub-sample (*n* = 125 males and 215 females) was extracted from the overall sample. Standardised Reappraisal and Suppression scores (ranging between 0 and 1) were calculated by dividing raw scale scores by the number of items in each respective scale and subsequently dividing those values by the item response range. These scores were then compared to similarly standardised scores reported by Gross and John (2003) for their sample of young adults (aged 18–20 years; *n* = 557 males and 936 females). Separate *t*-tests for males and females indicated that for Reappraisal use, there were no significant differences between adolescents (Males: *M* = .65, *SD* = .12; Females: *M* = .68, *SD* =

.13) and young adults (Males: *M* = .66, *SD* = .13; Females: *M* = .66, *SD* = .15). For Suppression use, adolescent females (*M* = .49, *SD* = .15) scored significantly higher than young adults (*M* = .45, *SD* = .17; $t_{(1139)}$ = 3.18, *p* < .01). Males did not differ on the use of this strategy (adolescents: *M* = .55, *SD* = .15; adults: *M* = .52, *SD* = .16).

Discussion

Through latent growth curve modelling analyses, the use and development of the Expressive Suppression and Cognitive Reappraisal ER strategies were assessed in a large sample of children and adolescents aged between 9 and 15 years, on three occasions, each one year apart. Overall, there was partial support for the predictions that over time and with increasing age there would be a decrease in the self-reported use of Expressive Suppression and an increase in the use of Cognitive Reappraisal, that there would be increasing continuity/stability in strategy use both over time and with increasing age, and that males would score higher on Suppression compared to females. The results are discussed in detail below.

With regard to Expressive Suppression, the predictions that use of this strategy would be lower for older participants compared to their younger peers, and that over time participants would report less use of this strategy, were supported by the Suppression model. However, the prediction that changes in Suppression use over time would decrease with increasing age, that is, that ER becomes more trait-like (Cole et al., 1994), was supported only for females. The significant interaction between sex and age for the slope of the Suppression model indicated that, whilst the rate of decrease over time was relatively stable for males, it became less marked with increasing age for females. Given that females mature earlier, this finding may indicate that use of this strategy stabilised earlier for females compared to males. Additional follow-up into later years may have detected a similar stabilisation for males and a further decrease in Suppression use for females.

However, future research is needed to investigate this claim.

On the whole, the findings related to the use of Expressive Suppression are supportive of John and Gross's (2004) contention that with experience and maturation, there is movement toward healthier emotion regulation. This finding suggests that decreased Suppression is a normative developmental achievement. Future research is recommended to further investigate this claim and to determine whether deviation from this developmental trend may provide a marker for a pathological developmental ER trajectory.

Regarding Reappraisal, the predictions that its use would be higher for older compared to younger participants and that, over time, participants would report more use of this strategy were not supported. In contrast to expectations, a significant negative relationship was found between age and the Reappraisal intercept, indicating significantly less use of this strategy by older compared to younger participants. There was also lack of support for the predicted decrease in the rate of change with increasing age. Rather, the Reappraisal slope indicated no significant change in use over the follow-up period, nor significant individual variability over that time. Thus, although stability was found over time, analysis of the broader developmental span from 9 to 15 years suggested an overall decrease. Of note, comparison between adolescent participants in the current study and a young adult sample (Gross & John, 2003) showed no difference.

These findings are difficult to interpret as they appear somewhat contradictory. It may be that the decrease found across age was too subtle to be detected longitudinally over a follow-up period of only two years. It may also be that decreases occurred at particular ages within the 9- to 15-year range and thus were not detected when examining change over two years for the sample as a whole. Despite this possibility, the non-significant slope variance for the Reappraisal model suggests that such variations are not likely. Thus, the findings for the developmental periods investigated herein do not support the theoretical proposal that given its positive relationship with psychological wellbeing, the use of the Cognitive Reappraisal increases with experience and maturation (John & Gross, 2004).

Although the predicted increased stability over time was not found, the results regarding this strategy may be reflective of previous research findings which have demonstrated that significant developmental changes in attempts at control of feeling states occur early (i.e., between ages 6 and 10 years) in the lifespan (Stegge & Meerum Terwogt, 2007). Thus, it could be that by age 9 years (i.e., the earliest age examined in the current research), predominant stability in Reappraisal use had already developed, supporting the trait-like nature of ER that has been proposed (Cole et al., 2004).

Regarding the predicted sex difference in Suppression use, males reported more use compared to females. In addition to being consistent with past research with young adults (c.f. Gross & John 2003), this finding is consistent with research on gender roles which has consistently demonstrated that males are less likely than females to be emotionally expressive (e.g. Kring & Gordon, 1998). Results related to Reappraisal use yielded an unexpected small, but nonetheless significant, negative association between sex and the model intercept. That is, males reported less use of Reappraisal compared to females. The very small size of this unexpected difference between males and females suggests a need to replicate this finding in future research.

The present study significantly contributes to research on ER through examination of post-early childhood and pre-adulthood developmental periods, a generally under-researched area (Fischer & Tangney, 1995; Izard, 2002; Southam-Gerow & Kendall, 2002). A particular strength of the study is the extension of Gross's (1998) process-oriented theoretical model of ER to a non-adult sample.

In relation to Suppression use, the findings support the proposal that with an increase in age, strategy use reflects the development of healthier or more skilful emotion regulation. The caveat to this conclusion is that a similar unexpected decrease was found for Reappraisal use. Possible explanations include the development of, and increased reliance with, maturation on other strategies not assessed in this study. It is also possible that the decrease in both Suppression and Reappraisal can in part be explained by the proposal that regulatory activity begins via deliberate processes but later occurs outside of conscious awareness (Bargh & Chartrand, 1999; Cole et al., 2004; Gross & Thompson, 2007; Mauss, Bunge, & Gross, 2007). Such a transition, in conjunction with the proposed trait-like nature of ER, may manifest in such a way that individuals develop habitual styles of responding to particular stimuli or situations. For example, scoring poorly on a test may be interpreted as providing information for improved future performance, as opposed to perceiving the low score as an indication that one has failed. Such a process may begin as one that is consciously initiated but if it develops into a habitual way of responding, it is unlikely that the individual will consciously evaluate it as positive reinterpretation (or Reappraisal). Therefore, it will likely not be assessable through self-report.

Limitations of the study include that only two ER strategies out of potentially many have been investigated. Thus, despite the arguments put forth by John and Gross (2004), that the two strategies of focus each represent a good exemplar of antecedent-focused (Cognitive Reappraisal) and response-focused (Expressive Suppression) strategies, and that both are strategies that are commonly used in everyday life, research would benefit from the examination of additional strategies. Another limitation relates to

the use of self-report methodology given possible limitations in children's understanding about emotions. However, self-reports may contain valuable information not available in the reports of other informants such as parents or teachers (Walden, Harris, & Catron, 2003). Such reports are necessarily context bound and may be biased by adult-centric perspectives (Soto, John, Gosling, & Potter, 2008). Self-reports may more accurately reflect one's behaviour and emotions across different situations. Most importantly, given their non-observable nature, individuals themselves are in a better position to report on their internal emotional experiences and cognitive processes as opposed to third parties. Nevertheless, while self-report offers the advantage of capturing subjective internal ER processes, multi-method and multi-informant approaches, including assessment of observable behaviours, have the potential to provide a broader understanding of the processes involved in ER.

Further, given that only 4% of the variance was explained in initial Reappraisal use, 15% in initial Suppression use, and 23% in change in Suppression use, the findings suggest a need to look at predictors other than age and sex which may explain individual differences in the use and development of these ER strategies. Included may be, for example, temperament, and attachment relationships. There is also the possibility of non-linear development of ER strategy use. Given that the current study tested only three time-points, examination of other growth models (e.g., quadratic, cubic) (McArdle, 2005) is recommended for future research.

Given the increasingly recognised role played by ER in mental health (e.g., Betts et al., 2009; Repetti, Taylor, & Seeman, 2002; Southam-Gerow & Kendall, 2002), this study addresses an important area of development. Comparison of the norms for the community sample reported herein with clinical samples will contribute significantly to future ER understanding and may prove particularly informative for the development and implementation of preventative and intervention strategies for youth mental health problems. Future research can build upon the current findings by including the assessment of strategies additional to Suppression and Reappraisal as well as other ER models (e.g., Shields & Cicchetti, 1997).

Acknowledgements

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Key points

- Emotion regulation involves intrinsic and extrinsic processes responsible for managing one's emotions toward goal accomplishment.
- This study extended adult research on emotion regulation through examination of two emotion regulation strategies (i.e. Cognitive Reappraisal and Expressive Suppression) in children and adolescents aged 9 to 15 years, over a two-year period.
- As expected, girls and older children reported less use of Suppression compared to boys and younger children.
- Older children reported less use of Cognitive Reappraisal compared to younger children; however, reported use was stable over time.
- The current study documents the development and norms for Cognitive Reappraisal and Expressive Suppression use in a community sample of children and adolescents.

References

Australian Bureau of Statistics. (1996). *Australian standard classification of occupations* (2nd edn). Canberra, Australia: Australian Bureau of Statistics.

Australian Bureau of Statistics. (2008). *2006 Census Data: Melbourne*. Retrieved April 9, 2008, from http://www.censusdata.abs.gov.au.

Bargh, J.A., & Chartrand, T.L. (1999). The unbearable automaticity of being. *American Psychologist, 54*, 462–479.

Betts, J., Gullone, E., & Allen, J.S. (2009). An examination of emotion regulation, temperament and parenting as potential predictors of adolescent depression risk status. *British Journal of Developmental Psychology, 27*, 473–485.

Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen, & J.S. Long, (Eds), *Testing structural equation models* (pp. 136–162. Newbury Park, CA: Sage.

Calkins, S.D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation: Biological and environmental transactions in early development. In J.J. Gross, (Ed), *Handbook of emotion regulation* (pp. 229–248. New York: Guilford Press.

Cole, P.M., Martin, S.E., & Dennis, T.A. (2004). Emotion regulation as a scientific construct: Methodological

challenges and directions for child development research. *Child Development*, *75*, 317–333.

Cole, P.M., Michel, M.K., & Teti, L.O. (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the Society for Research in Child Development*, *59*, 73–100, 250–283.

Eisenberg, N., Champion, C., & Ma, Y. (2004). Emotion-related regulation: An emerging construct. *Merrill-Palmer Quarterly*, *50*, 236–259.

Fischer, K.W., & Tangney, J.P. (1995). Self-conscious emotions and the affect revolution: Framework and overview. In J.P. Tangney, & K.W. Fischer, (Eds), *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride* (pp. 3–22. New York: Guilford Press.

Gross, J.J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*, 271–299.

Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.

Gross, J.J., & Thompson, R.A. (2007). Emotion regulation: Conceptual foundations. In J.J. Gross, (Ed), *Handbook of emotion regulation* (pp. 3–24. New York: Guilford Press.

Hu, L., & Bentler, P.M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*, 424–453.

Izard, C.E. (2002). Translating emotion theory and research into preventive interventions. *Psychological Bulletin*, *128*, 796–824.

Jaffe, M., Gullone, E., & Hughes, E.K. (2009). *The role of temperamental dispositions and parenting experiences in the use of two emotion regulation strategies in late childhood*. In press.

John, O.P., & Gross, J.J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, *72*, 1301–1333.

Kring, A.M., & Gordon, A.H. (1998). Sex differences in emotion: Expression, experience, and physiology. *Journal of Personality and Social Psychology*, *74*, 686–703.

MacDermott, S.T., Betts, J., Gullone, E., & Allen, J.S. (2009). *Emotion regulation in childhood and adolescence: A revised version of the Emotion Regulation Questionnaire (ERQ-CA)*. Manuscript submitted for publication.

Mauss, I.B., Bunge, S.A., & Gross, J.J. (2007). Automatic emotion regulation. *Social and Personality Psychology Compass*, *1*, 146–167.

McArdle, J.J. (2005). Latent growth curve analysis using structural equation modeling techniques. In D.M. Teti, (Ed), *Handbook of research methods in developmental science* (pp. 340–366. Malden, MA: Blackwell.

Morris, A.S., Silk, J.S., Steinberg, L., Myers, S.S., & Robinson, L.R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, *16*(2), 361–388.

Penza-Clyve, S., & Zeman, J. (2002). Initial validation of the Emotion Expression Scale for Children (EESC). *Journal of Clinical Child and Adolescent Psychology*, *31*, 540–547.

Repetti, R.L., Taylor, S.E., & Seeman, T.E. (2002). Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin*, *128*, 330–366.

Shields, A., & Cicchetti, D. (1997). Emotion regulation among school-age children: The development and validation of a new criterion Q-sort scale. *Developmental Psychology*, *33*, 906–916.

Soto, C.J., John, O.P., Gosling, S.D., & Potter, J. (2008). The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, *94*, 718–737.

Southam-Gerow, M.A., & Kendall, P.C. (2002). Emotion regulation and understanding implications for child psychopathology and therapy. *Clinical Psychology Review*, *22*, 189–222.

Stegge, H., & Meerum Terwogt, M. (2007). Awareness and regulation of emotion in typical and atypical development. In J. J Gross, (Ed), *Handbook of emotion regulation* (pp. 249–268. New York: Guilford Press.

Suveg, C., & Zeman, J. (2004). Emotion regulation in children with anxiety disorders. *Journal of Clinical Child and Adolescent Psychology*, *33*, 750–759.

Srivastava, S., Tamir, M., McGonigal, K.M., John, O.P., & Gross, J.J. (2009). The social costs of emotional suppression: A prospective study of the transition to college. *Journal of Personality and Social Psychology*, *96*, 883–897.

Thompson, R.A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*, 25–52.

Walden, T.A., Harris, V.S., & Catron, T.F. (2003). How I Feel: A self-report measure of emotional arousal and regulation for children. *Psychological Assessment*, *15*, 399–412.