



*Brief reports*

**An examination of emotion regulation, temperament, and parenting style as potential predictors of adolescent depression risk status: A correlational study**

Jennifer Betts, Eleonora Gullone\* and J. Sabura Allen

School of Psychology, Psychiatry, and Psychological Medicine, Monash University, Melbourne, Victoria, Australia

Given that depression is a debilitating disorder, it is critical that we advance our understanding about the aetiology of this disorder. This study investigated both traditional (temperament and parenting) and novel (emotion regulation strategy) risk factors associated with adolescent depression. Forty-four adolescents (12–16 years; 64% females) with high scores on a self-report depressive symptomatology questionnaire were compared to a similar group of 44 adolescents with low scores, matched for age, gender, and ethnicity. Significant group differences were present on all assessed risk factors. The presence of high depressive symptomatology was found to be associated with (1) low levels of temperamentally based positive mood, flexibility, and approach behaviours, (2) a parenting style characterized by low nurturance and high overprotection, and (3) emotion regulation characterized by higher levels of expressive suppression and lower levels of cognitive reappraisal. It was concluded that, in addition to specific temperament characteristics and parenting style, use of particular emotion regulation strategies is associated with varying levels of depressive symptomatology. These findings reinforce the importance of incorporating emotion regulation into explanatory models of depression symptomatology. Further research that tests the direction of effects for these cross-sectional findings is warranted.

Depression is ranked as the fourth leading cause of disability and premature death worldwide (Murray & Lopez, 1996). Adolescence constitutes one of the peak risk periods for developing depression, with the mean onset age being 14.7 years for females and 15.4 years for males (Lewinsohn, Joiner, & Rohde, 2001). Therefore, an understanding of the risk factors that predict possible pathways to the development of this disorder, as well as protective factors, is essential in order to contribute to the prevention and treatment of adolescent depression.

\*Correspondence should be addressed to Associate Professor Eleonora Gullone, School of Psychology, Psychiatry, and Psychological Medicine, Monash University, Melbourne, Vic., Australia 3800 (e-mail: e.gullone@med.monash.edu.au).

Although researchers have operationalised and measured depression in different ways, including self-report symptomatology questionnaires and clinical diagnosis assessments, the findings for adolescent samples have been relatively consistent and as such, the term 'depression' is used to encompass the range of methodologies. Research evidence indicates that an affectionless control parenting style and individual differences in temperament are important predictors of risk status for the development of depression during adolescence. Of particular relevance to the current study, recent research with adults has indicated that the regulation of emotion represents an important process variable that may be implicated in the development of depression (e.g. Gross & Munoz, 1995).

### **Emotion regulation**

While definitions vary, it is widely accepted that emotion regulation involves 'the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals' (Thompson, 1994, pp. 27-28). Distinct from concepts of control, which primarily emphasize the restriction, inhibition, or minimization of negative emotions, emotion regulation also encompasses the initiation, maintenance, and enhancement of emotions, and involves both positively and negatively valenced emotions (Gross, 1998).

Theoretical and empirical work to date indicates that particular emotion regulation strategies may have 'profoundly different implications for well-being' (Gross & John, 2002, p. 298) with some strategies being inherently more or less adaptive (Bridges, Denham, & Ganiban, 2004). For example, some empirical work has shown that children's use of suppression (the inhibition of emotional expression) to manage their angry and sad emotions is predictive of higher levels of internalizing (depressive and anxiety) symptoms (Zeman, Shipman, & Suveg, 2002). Also, the strategy of thought suppression has been associated with depression in adults, while the strategies of attention to emotions and willingness to self-disclose negative emotions have been related to the absence of depression (Rude & McCarthy, 2003).

Given the 'potentially overwhelming number' (Gross, 1998, p. 281) of emotion regulation strategies, Gross (1998) has proposed that strategies be classified according to their temporal position along the emotion generative pathway, and that antecedent-focused strategies (those occurring before an emotional response tendency becomes fully activated), are more adaptive because they can modify the entire emotional sequence, thus being more efficacious for achieving the desired end. Conversely, response-focused strategies (that occur once an emotion has been activated) are viewed as more maladaptive as they are limited to acting upon the already activated emotion, thus having a smaller effect.

Extensive empirical work with adults conducted by Gross and colleagues supports this proposition. Inhibiting the expression of one's emotions, that is, expressive suppression, is a response-focused strategy that has been associated with greater physiological, cognitive, and social costs than cognitive reappraisal, an antecedent-focused strategy involving thinking about a potentially emotion-eliciting situation in a way that changes its emotional impact. In contrast to reappraisal, expressive suppression has not been associated with a positive change in the experience of negative emotion (Gross & John, 2002). In addition, greater use of expressive suppression and less frequent use of cognitive reappraisal have been associated with depression in adults (Gross & John, 2003). Importantly, researchers have found

that, after addressing the effects of potentially confounding issues, such as differences in the intensity of emotions experienced and the presence of current depressive symptoms which may potentially bias reporting, the relationship between emotion regulation strategies and depression remained robust (Gross & John, 2003; Rude & McCarthy, 2003).

On the basis of findings such as those described above, it has been proposed that increases in negative affect and mood may be managed inappropriately with maladaptive strategies, such as expressive suppression. In this context, emotions become overwhelming, potentially resulting in an individual experiencing depressed mood of a severity that would warrant a diagnosis of clinical depression (Gross & Munoz, 1995). In contrast, managing negative affect and mood with more adaptive strategies, such as cognitive reappraisal, may have a protective effect. While emotion regulation has only recently been considered as a potential risk factor, two factors that have traditionally been associated with adolescent depressive symptomatology include an adolescent's temperament and their perceived parenting experiences.

### **Temperament and behavioural inhibition**

In line with Kagan's (1997) construct of behavioural inhibition, research has consistently shown that individual differences characterized by a tendency to respond flexibly to environmental changes, to approach rather than withdraw from novel stimuli, and to experience positively valenced moods contribute to an individual's adaptability and psychological wellbeing (Windle, 1992a). In contrast, a response style that comprises low levels of one or more of these tendencies has been empirically associated with depression in adolescents (e.g. Muris, Meesters, & Spinder, 2003; Muris, Merckelbach, Schmidt, Gadet, & Bogie, 2001; Windle, 1992b; Windle & Mason, 2004). Indeed, low levels of approach have been associated with depression longitudinally (Leve, Kim, & Pears, 2005) and found to distinguish between adolescents with depression among other disorders (e.g. learning disorders and alcohol use problems; Masi *et al.*, 2003; Windle & Davies, 1999).

The processes through which such response styles relate to depression remains unclear. It has been posited that several mechanisms may be in operation, such that temperamental styles of responding create a direct vulnerability which impacts upon individuals' selection of activities and environments subsequently influencing their interactions with others and environments (Rutter, 1989). For example, low levels of approach and flexibility of responding may contribute to poorer adjustment to change which may result in thoughts of hopelessness and avoidance of new peer interactions, which in-turn may create social isolation; each of which contribute to the development of depression.

In addition to the demonstrated importance of temperamental response styles, environmental factors have also been demonstrated to be pertinent in understanding depression. Of particular relevance to the current study are adolescents' experiences of parenting.

### **Parenting**

Parenting that is characterized as being warm, nurturing and as allowing appropriate autonomy to offspring has traditionally been viewed as optimal. Indeed, research with adolescents has consistently shown the experience of cold, unavailable caregiving to be associated with depression (e.g. Biggam & Power, 1998; Chambers, Power, Loucks,

& Swanson, 2000a, 2000b; Rapee, 1997). Relatedly, numerous studies have demonstrated that caregiving characterized by controlling and intrusive parental behaviour is also related to depression (e.g. Martin & Waite, 1994; McFarlane, Bellissimo, & Norman, 1995; Patton, Coffey, Posterino, Carlin, & Wolfe, 2001).

Without adequate parental nurturance and encouragement of autonomy, a secure bond between parent and offspring may not develop, and as a consequence, the young person has been shown to develop low levels of self-confidence in addition to difficulties in establishing trusting and supportive relationships with others (Kraaij *et al.*, 2003). Adolescents whose relationships are characterized by insecurity are at risk of adverse outcomes including the development of a sense of learned helplessness. Such dysfunctional relationships also impair progress towards independence and are predictive of compromised social and personality development (Bowlby, 1977; Parker, 1993) all of which place the individual at risk for the development of depression.

It is also noteworthy that temperamental dispositions and parenting styles have been proposed to be of particular importance for the development of emotion regulation. Specifically, Southam-Gerow and Kendall (2002) have described temperament as the 'blue print and foundation from which and on which emotional development "builds"' (p. 192). These authors have proposed that contextual and relational variables including parenting and attachment have a moderating influence on outcomes associated with temperamental style. Thus, it is likely that individual differences in temperament interact with these contextual/relational variables in the development of emotion regulation (e.g. Calkins, 1994).

### ***The study of emotion regulation in adolescents***

The growing field of emotion regulation research has faced several conceptual and methodological challenges. Through a reliance on observational and parent-report measures, infant and childhood studies have typically emphasized the external aspects of emotion regulation, such as emotional expression, while overlooking the internal, subjective emotion regulation processes. Upon reaching childhood or adolescence, self-report measures are developmentally appropriate for assessment and are recommended as they are capable of tapping into subjective internal processes. Thus, their employment is likely to advance our knowledge of emotion regulation in these older developmental periods (Gross & John, 2003; Zeman *et al.*, 2002).

With a small number of notable exceptions (e.g. Keiley & Seery, 2001; Shipman, Zeman, & Stegall, 2001), several infant, child, and adolescent research studies have purported to assess emotion regulation but have conceptualized or measured this construct in ways that differ from generally accepted definitions. For example, some studies have focused solely on examining processes for decreasing negative emotions in the context of environmental stressors, which, it may be argued, are more in accordance with coping research (e.g. Garber, Braafladt, & Weiss, 1995; Garnefski *et al.*, 2002). Other studies have employed assessment tools that could better be described as measures of temperament (e.g. Gumora & Arsenio, 2002) or attachment (e.g. Cooper, Shaver, & Collins, 1998), or have used measures with unclear validity and reliability (e.g. Boekaerts, 2002 measured emotion regulation with a single question). These inconsistencies are likely to be a reflection of the immaturity of the research field, but are nevertheless issues that need to be addressed. In the current study, by using a self-report measure that has been previously validated as a measure of two emotion

regulation strategies that manage both positive and negative emotions in a young adult sample (Gross & John, 2003), we have attempted to address these issues.

### The current study

The current study aimed to advance understanding of factors that are associated with the experience of depressive symptomatology, by comparing a group of adolescents with high levels of depressive symptomatology to those with low levels. In line with past research, it was hypothesized that adolescents with higher levels of depressive symptomatology would report using expressive suppression more frequently and cognitive reappraisal less frequently. It was also predicted that adolescents with higher depressive symptomatology would report lower levels of positive moods, flexibility, and approachability to novel situations, and would report experiencing less caring and more overprotective parenting.

## Method

### Participants

The current sample comprised 88 adolescents (33 males, 55 females) aged between 12 and 16 years ( $M = 13.92$  years,  $SD = 1.21$ ), who were drawn from a larger sample, recruited as part of a broader study ( $N = 375$ ). The majority of participants from the original sample were born in Australia (84.3%) or Asia (9.9%). Further, 86.2% of the original sample lived with two parents and 13.8% lived with a single parent. This distribution is representative of the community in the broader Victorian state of Australia (Australian Bureau of Statistics, 2002). Table 1 details the characteristics of the current sample.

**Table 1.** Demographic characteristics of the groups and total sample

	Low depressive symptomatology group ( $N = 44$ ) Frequency (Proportion)	High depressive symptomatology group ( $N = 44$ ) Frequency (Proportion)	Total ( $N = 88$ ) Frequency (Proportion)
Age			
12 years	6 (13.6%)	7 (15.9%)	13 (14.8%)
13 years	10 (22.7%)	9 (20.5%)	19 (21.6%)
14 years	13 (29.5%)	14 (31.8%)	27 (30.7%)
15 years	11 (25%)	9 (20.5%)	20 (22.7%)
16 years	4 (9.1%)	5 (11.4%)	9 (10.2%)
Gender			
Male	17 (38.6%)	16 (36.4%)	33 (37.5%)
Female	27 (61.4%)	28 (63.6%)	55 (62.5%)
Ethnicity			
Australia	38 (86.4%)	36 (81.1%)	74 (84.1%)
Middle East	1 (2.3%)	0 (0%)	1 (1.1%)
Mainland South-East Asia	1 (2.3%)	3 (6.8%)	4 (4.5%)
Maritime South-East Asia	1 (2.3%)	2 (4.5%)	3 (3.4%)
Chinese Asia	1 (2.3%)	0 (0%)	1 (1.1%)
Southern Asia	2 (4.5%)	2 (4.5%)	4 (4.5%)
Southern and East Africa	0 (0%)	1 (2.3%)	1 (1.1%)

Most participants were recruited through their secondary schools (11 schools including metropolitan and rural schools, and government and private), although seven were recruited through individuals who worked or studied at Monash University. The two methods were used to enhance recruitment potential. The participation rate of school-recruited adolescents was approximately 12.8%, although the proportion of parents who received copies of the explanatory statements given to students at school was unclear rendering valid estimation of parent consent rate questionable.

## **Measures**

### *Depressive symptomatology*

The 30-item Reynolds Adolescent Depression Scale – Second Edition, (RADS-2; Reynolds, 2002) was administered to assess depressive symptomatology. The items comprise statements, such as ‘I feel upset’, which are responded to on a 4-point Likert scale, with higher scores indicate higher levels of depressive symptoms. Based on previous research by Reynolds (2002) and consistent with the test manual, participants scoring above the predetermined cut-off point, a raw score of 76 or greater, fell into the ‘clinical range’. Reynolds reported excellent reliability ( $\alpha = .93$ ) for the RADS-2 in clinical and school-based samples, which is similar to the current study’s finding of .96. Further, strong evidence supports the convergent validity of this measure with other measures of adolescent psychopathology and suicidal behaviours, and discriminant validity with measures of social desirability and academic achievement (Reynolds, 2002).

### *Emotion regulation strategies*

Participants completed the 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) to assess the two emotion regulation strategies of expressive suppression (four items) and cognitive reappraisal (six items). Wording of the items from Gross and John’s adult version was simplified to enhance the comprehension of the items by younger adolescents. For example, the original item ‘When I am feeling positive emotions, I am careful not to express them’ was reworded to ‘When I am feeling happy, I am careful not to show it’. The response scale was also changed from a 7 to a 5-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’. Higher scores reflect more frequent use of each strategy. Sound reliability, convergent validity with measures of behaviour–attitude incongruence, coping and mood management methods, and discriminant validity with measures of personality factors, impulse control, cognitive ability, and social desirability, have been reported for the ERQ with both younger and older adults (Gross & John, 2003; John & Gross, 2004). Construct validity has also been demonstrated with a two factor structure supporting the structure of the two subscales of cognitive reappraisal and expressive suppression. With the current sample of adolescents, sound reliability was found with a Cronbach’s  $\alpha$ s of .81 for the suppression scale and .86 for the reappraisal scale. This is consistent with previous research that has identified a Cronbach’s  $\alpha$  of between .68 and .76 for the suppression scale and between .75 and .82 for the reappraisal scale (Gross & John, 2003).

### *Temperament*

The three subscales of the Revised Dimensions of Temperament Survey (DOTS-R; Windle & Lerner, 1986) that reflect adaptability (Windle, 1992a) were administered:

approach-withdrawal (seven items); flexibility-rigidity (five items); and positive mood quality (seven items). Given that higher scores reflect greater tendencies to approach novelty, to respond flexibly to changes in the environment and to experience positive moods, respectively, herein these dimensions will be labelled approach, flexibility, and positive mood quality. Example items, all of which are inversely scored, include 'When things are out of place, it takes me a long time to get used to it' (flexibility), 'My first reaction is to reject something new or unfamiliar to me' (approach), and 'I do not laugh or smile at many things' (positive mood quality), to which participants respond on a 4-point Likert scale. Sound reliability and divergent validity with measures of perceived psychosocial functioning (cognitive competence, social competence, and self-worth) have previously been demonstrated for the DOTS-R (Luby & Steiner, 1993; Windle & Lerner, 1986; Windle *et al.*, 1986). Consistent with this, in the current study, adequate internal consistency was demonstrated with Cronbach's  $\alpha$ s of .78 for approach, .72 for flexibility, and .93 for positive mood quality.

### *Parenting*

Participants completed the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) to assess their perceptions of parental behaviour along two bipolar dimensions: the 12-item care dimension (with higher scores reflecting greater warmth and nurturance) and the 13-item overprotection dimension (with higher scores representing intrusiveness and control). Items were revised to elicit current rather than retrospective perceptions (Herz & Gullone, 1999) and responses were provided on a 4-point Likert scale. Example items include 'Tries to control everything I do' (overprotection) and 'Is affectionate to me' (care). The PBI has been shown to have good concurrent inter-rater validity (Herz & Gullone, 1999; Parker *et al.*, 1979) and excellent reliability (Herz & Gullone, 1999; Parker *et al.*, 1979; Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). The current study provides further evidence of sound reliability, with the care scale yielding a Cronbach's  $\alpha$  of .92 and the overprotection scale a Cronbach's  $\alpha$  of .86.

### *Procedure*

The study was conducted following approval from university and school ethics boards as well as school principals. As part of a larger study, schools located in Melbourne, Australia, a metropolitan capital city and in towns in rural areas around Melbourne were sent information packs (comprising introductory letter, explanatory statements, and consent forms) inviting their participation. Following schools' agreement to be involved in the study, principals were sent information packets (explanatory statements and consent forms) to forward to parents of students in their school. Additional participants recruited via a newsletter sent to university staff and postgraduate students were sent information packets upon expressing their interest in the study. Parent and adolescent written informed consent was obtained prior to participation.

The questionnaires were counterbalanced to control for order effects in responding, and were administered in either group format during school hours or individually via postal mail during the adolescent's own time. The questionnaires took approximately 50 minutes to complete, depending largely on participant age. Participants were informed that participation was voluntary, that they were free to cease their

involvement at any time and that their returned questionnaires would be confidential unless their response profile warranted concern about their safety.

Contact with principals, student welfare coordinators, or parents (for non-school-based participants) was made if a participant scored in the 'clinical range' on the RADS-2 (Reynolds, 2002). Forty-four participants fell in the clinical range and formed the high depressive symptomatology group ( $M = 13.91$  years,  $SD = 1.24$ ). A group comprising adolescents with low depressive symptomatology ( $M = 13.93$  years,  $SD = 1.19$ ) was also formed by selecting (from our larger sample) adolescents who scored below the clinical range and who were matched with the high scoring group on age, gender, and ethnicity (see Table 1).

### Statistical analysis

All statistical analyses were performed with the Statistical Package for Social Sciences (SPSS) Version 12.0.1. Pearson's Product-Moment correlation analyses were carried out between the study variables. A one-way multivariate analysis of variance (MANOVA) was performed to determine whether there were significant differences between the two depression status groups in temperament subscales (approach, flexibility, and positive mood quality), parenting dimensions (care and overprotection), and emotion regulation strategies (reappraisal and suppression). Partial eta square indicated effect size, and Cohen's classification system was used to judge magnitude.

## Results

Group descriptive statistics were determined for each variable (Table 2). The low depressive symptomatology group evidenced a higher mean score on each of approach, flexibility, positive mood quality, care, and reappraisal. The high depressive symptomatology group was found to have a higher mean score on each of overprotection and suppression. Standard deviations were relatively consistent across the groups, with the exception of the care parenting dimension, on which the high depressive symptomatology participants evidenced greater variability.

**Table 2.** Group descriptive statistics and differences for the emotion regulation, parenting, and temperament variables

	Low depressive symptomatology group ( $N = 44$ ) $M$ ( $SD$ )	High depressive symptomatology group ( $N = 44$ ) $M$ ( $SD$ )
Temperament		
Approach	21.93 (3.24)	17.70 (3.76)***
Flexibility	14.98 (3.20)	12.30 (2.65)***
Positive mood quality	25.80 (3.27)	17.86 (4.89)***
Parenting		
Care	29.18 (5.49)	21.84 (8.09)***
Overprotection	11.86 (7.07)	17.34 (7.47)**
Emotion regulation strategies		
Suppression	9.43 (3.15)	12.52 (3.23)***
Reappraisal	20.34 (4.64)	17.98 (4.37)*

Note. Significant differences are indicated as \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (two-tailed).



The MANOVA revealed significant differences between the two depression status groups [ $F_{(7,80)} = 16.50, p < .001$ ], with a corresponding medium effect size [partial  $\eta^2 = .59$ ]. The high depressive symptomatology group scored lower than the low depressive symptomatology group on the parenting care dimension [ $F_{(1,86)} = 24.79, p < .001$ ] and higher on the parenting overprotection dimension [ $F_{(1,86)} = 12.47, p < .01$ ] (see Table 2). A small effect size was associated with these findings [partial  $\eta^2 = .22$  and  $.13$ , respectively].

Further, the high symptomatology group scored lower than the low symptomatology group on temperamental approach [ $F_{(1,86)} = 31.90, p < .001$ ], flexibility [ $F_{(1,86)} = 18.39, p < .001$ ], and positive mood quality [ $F_{(1,86)} = 80.00, p < .001$ ] (refer to Table 2). Group differences were small for approach and flexibility [partial  $\eta^2 = .27$  and  $.18$ , respectively]. A medium effect size was present with regard to positive mood quality [partial  $\eta^2 = .48$ ].

With regard to emotion regulation, those in the high depressive symptomatology group were found to use the regulation strategy of suppression more frequently [ $F_{(1,86)} = 20.64, p < .001$ ] and the reappraisal strategy less frequently [ $F_{(1,86)} = 6.05, p < .05$ ] than the low depressive symptomatology group (see Table 2). The differences in suppression and reappraisal were of small effect size [partial  $\eta^2 = .19$  and  $.07$ , respectively].

## Discussion

This study investigated both novel (emotion regulation strategy) and previously researched (parenting and temperament) variables proposed to be important correlates of depressive symptomatology. Importantly, it was found that adolescents with high levels of depressive symptomatology reported significantly more frequent use of the emotion regulation strategy of expressive suppression and less frequent use of the cognitive reappraisal strategy compared to the matched adolescents with low depressive symptomatology. In addition, the predicted associations were found between high levels of symptomatology and lower levels of approach behaviours, flexibility of responding and tendency to experience positive moods. Further, higher levels of depressive symptomatology were associated with parenting characterized by lower levels of care and nurturance and higher levels of overprotective behaviour (i.e. affectionless-control parenting).

Before discussing these findings further, some limitations of this study are worthy of consideration. Due to the cross-sectional nature of the study, the direction of influence is not conclusive. While it is posited, for example, that use of particular emotion regulation strategies render an individual vulnerable to developing depression, it is equally plausible that the presence of depression leads an individual to employ particular strategies. A second limitation relates to the assessment method used which involved only self-report. Research has shown, however, that participants scoring above the depression measure's 'clinical cut-off' point have symptoms of clinical severity (Reynolds, 2002). Related to the assessment method used is the potential for biased responding based on the respondent's mood at the time of participation. To minimize this potential, measures were carefully selected to ensure they had appropriate divergent/convergent validity with depression-related and non-depression-related variables in addition to good test-retest reliability, therefore reducing the likelihood of transient mood effects. Finally, a particularly noteworthy limitation is a rather low

response rate. Although no information is available to determine the characteristics of non-responders, demographic data for the recruited sample was found to be reflective of the local state community, providing a reasonable level of confidence in the representativeness of the sample. Moreover, the replication of previously reported findings regarding the differences between low and high depressive symptomatology groups with regard to the well researched depression correlates of temperament/behavioural inhibition and parenting experiences, lends confidence to the integrity of the data.

The unique aspect of this study relates to its examination of emotion regulation as a correlate of depressive symptomatology. Our findings are particularly noteworthy given that this is the first time that these relationships have been demonstrated in an adolescent sample. Specifically, as predicted, it was found that high levels of depressive symptomatology were associated with high levels of expressive suppression and low levels of cognitive reappraisal. Such findings provide further support for the proposal that particular emotion regulation strategies are inherently more or less adaptive based on their temporal position along the emotion generative pathway, with response-focused strategies being less adaptive as they are limited to acting upon the already generated emotion (Gross, 1998; Gross & John, 2002). Based on the current findings, it is reasonable to propose that high use of the response-focused suppression strategy may constitute a risk factor for adolescent depression whilst the strategy of reappraisal may constitute a protective factor.

The validity of these unique emotion regulation findings is further enhanced by the replication of previous research findings relating to two traditional risk factors: perceived parenting and adolescent temperament. In accordance with extant research (e.g. Biggam & Power, 1998; Chambers *et al.*, 2000a; Leve *et al.*, 2005; Windle, 1992b), adolescents with high levels of depressive symptomatology reported lower levels of flexibility and approachability, and fewer temperamentally based positive moods. They also reported parenting that was less nurturing and more overprotective.

Further, the current findings relating to positive mood are in line with proposals and empirical research related to the tripartite model of anxiety and depression of Watson *et al.*, (1995). The three factor structure for negative affectivity including general distress, anhedonia versus positive affect, and somatic anxiety has linked low positive affect specifically to the experience of depressive symptoms. This structure was subsequently replicated by Boyd and Gullone (1997) with an adolescent sample when using the RADS.

One of the key strengths of this study is that it has addressed previous conceptual and methodological issues by employing a widely accepted definition of emotion regulation and by utilizing a well-validated measure of emotion regulation. The demonstration of the potentially important role played by the emotion regulation strategies of reappraisal and suppression in adolescent depression is extremely valuable and calls for further research to replicate these findings using alternative assessment techniques and methodologies. The inclusion of other-report measures would help to overcome potential problems with systematic response distortions or method variance, although such would also introduce the problem of interpretation of reporter discrepancy (Hughes & Gullone, 2008a,b).

Further, given the limitations posed by the cross-sectional design of the present study, research using a longitudinal design is recommended. Future research would also potentially benefit from the inclusion of additional variables that are pertinent to the adolescent developmental period, such as peer group relations and gender. Should these

emotion regulation strategies prove to be associated with the development of depression, they represent an important target for prevention and treatment programs in clinical psychology and psychiatry.

## References

- Australian Bureau of Statistics (2002). 2001 Census Data: Victoria. Retrieved March 14, 2006, from <http://www.abs.gov.au/ausstats/abs@cpp.nsf/DetailsPage/22001?OpenDocument&tabname=Details&prodno=2&issue=2001&num=&view=&#Basic%20Community%20Profile>
- Biggam, F. H., & Power, K. G. (1998). The quality of perceived parenting experienced by a group of Scottish incarcerated young offenders and its relation to psychological distress. *Journal of Adolescence, 21*(2), 161-176.
- Boekaerts, M. (2002). Intensity of emotions, emotional regulation, and goal framing: How are they related to adolescents' choice of coping strategies? *Anxiety, Stress and Coping: An International Journal, 15*(4), 401-412.
- Bowlby, J. (1977). The making and breaking of affectional bonds: I. Aetiology and psychopathology in the light of attachment theory. *British Journal of Psychiatry, 130*, 201-210.
- Boyd, C. P., & Gullone, E. (1997). An investigation of negative affectivity in Australian adolescents. *Journal of Clinical Child Psychology, 26*, 190-197.
- Bridges, L. J., Denham, S. A., & Ganiban, J. M. (2004). Definitional issues in emotion regulation research. *Child Development, 75*(2), 340-345.
- Calkins, S. D. (1994). Origins and outcomes of individual differences in emotion regulation. *Monographs of the Society for Research in Child Development, 59*(2-3), 53-72 250-283.
- Chambers, J. A., Power, K. G., Loucks, N., & Swanson, V. (2000a). Psychometric properties of the parental bonding instrument and its association with psychological distress in a group of incarcerated young offenders in Scotland. *Social Psychiatry and Psychiatric Epidemiology, 35*(7), 318-325.
- Chambers, J. A., Power, K. G., Loucks, N., & Swanson, V. (2000b). The quality of perceived parenting and its association with peer relationships and psychological distress in a group of incarcerated young offenders. *International Journal of Offender Therapy and Comparative Criminology, 44*(3), 350-368.
- Cooper, M., Shaver, P. R., & Collins, N. L. (1998). Attachment styles, emotion regulation, and adjustment in adolescence. *Journal of Personality and Social Psychology, 74*(5), 1380-1397.
- Garber, J., Braafladt, N., & Weiss, B. (1995). Affect regulation in depressed and non-depressed children and young adolescents. *Development and Psychopathology, 7*, 93-116.
- Garnefski, N., van Den Kommer, T., Kraaij, V., Teerds, J., Legerstee, J., & Onstein, E. (2002). The relationship between cognitive emotion regulation strategies and emotional problems: Comparison between a clinical and non-clinical sample. *European Journal of Personality, 16*(5), 403-420.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299.
- Gross, J. J., & John, O. P. (2002). Wise emotion regulation. In L. Feldman-Barrett & P. Salovey (Eds.), *The wisdom in feeling: Psychological processes in emotional intelligence* (pp. 297-318). New York: Guilford Press.
- 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*(2), 348-362.
- Gross, J. J., & Munoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice, 2*, 151-164.
- Gumora, G., & Arsenio, W. F. (2002). Emotionality, emotion regulation, and school performance in middle school children. *Journal of School Psychology, 40*(5), 395-413.

- Herz, L., & Gullone, E. (1999). The relationship between self-esteem and parenting style: A cross-cultural comparison of Australian and Vietnamese Australian adolescents. *Journal of Cross-Cultural Psychology*, 30(6), 742-761.
- Hughes, E. K., & Gullone, E. (2008a). Internalising symptoms and disorders in families of adolescents: A review of the literature. *Clinical Psychology Review*, 28, 92-117.
- Hughes, E. K., & Gullone, E. (2008b). Discrepancies between adolescent, mother, and father reports of adolescent internalising symptoms and the contribution of parent psychopathology. *Psychological Assessment*. Manuscript submitted for publication.
- John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, 72(6), 1301-1333.
- Kagan, J. (1997). Temperament and the reactions to unfamiliarity. *Child Development*, 68, 139-143.
- Keiley, M. K., & Seery, B. L. (2001). Affect regulation and attachment strategies of adjudicated and non-adjudicated adolescents and their parents. *Contemporary Family Therapy: An International Journal*, 23(3), 343-366.
- Kraaij, V., Garnefski, N., de Wilde, E. J., Dijkstra, A., Gebhardt, W., Maes, S., et al. (2003). Negative life events and depressive symptoms in late adolescence: Bonding and cognitive coping as vulnerability factors? *Journal of Youth and Adolescence*, 32(3), 185-193.
- Leve, L. D., Kim, H. K., & Pears, K. C. (2005). Childhood temperament and family environment as predictors of internalizing and externalizing trajectories from ages 5 to 17. *Journal of Abnormal Child Psychology*, 33(5), 505-520.
- Lewinsohn, P. M., Joiner, T. E. J., & Rohde, P. (2001). Evaluation of cognitive diathesis-stress models in predicting major depressive disorder in adolescents. *Journal of Abnormal Psychology*, 110(2), 203-215.
- Luby, J. L., & Steiner, H. (1993). Concordance of parent-child temperament ratings in a clinical sample of adolescent girls. *Child Psychiatry and Human Development*, 23(4), 297-305.
- Martin, G., & Waite, S. (1994). Parental bonding and vulnerability to adolescent suicide. *Acta Psychiatrica Scandinavica*, 89(4), 246-254.
- Masi, G., Mucci, M., Favilla, L., Brovedani, P., Millepiedi, S., & Perugi, G. (2003). Temperament in adolescents with anxiety and depressive disorders and in their families. *Child Psychiatry and Human Development*, 33(3), 245-259.
- McFarlane, A. H., Bellissimo, A., & Norman, G. R. (1995). Family structure, family functioning and adolescent well-being: The transcendent influence of parental style. *Journal of Child Psychology and Psychiatry*, 36(5), 847-864.
- Muris, P., Meesters, C., & Spinder, M. (2003). Relationship between child- and parent-reported behavioural inhibition and symptoms of anxiety and depression in normal adolescents. *Personality and Individual Differences*, 34, 759-771.
- Muris, P., Merckelbach, H., Schmidt, H., Gadet, B., & Bogie, N. (2001). Anxiety and depression as correlates of self-reported behavioural inhibition in normal adolescents. *Behaviour Research and Therapy*, 39, 1051-1061.
- Murray, C. J. L. & Lopez, A. D. (Eds.), (1996). *The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020*. Cambridge, MA: Harvard University Press.
- Parker, G. (1993). Parental rearing style: Examining for links with personality vulnerability factors for depression. *Social Psychiatry and Psychiatric Epidemiology*, 28(3), 97-100.
- Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British Journal of Medical Psychology*, 52, 1-10.
- Patton, G., Coffey, C., Posterino, M., Carlin, J., & Wolfe, R. (2001). Parental 'affectionless control' in adolescent depressive disorder. *Social Psychiatry and Psychiatric Epidemiology*, 36(10), 475-480.
- Rapee, R. M. (1997). Potential role of childrearing practices in the development of anxiety and depression. *Clinical Psychology Review*, 17(1), 47-67.

- Reynolds, W. M. (2002). *Reynolds adolescent depression scale - 2*. Odessa, FL: Psychological Assessment Resources.
- Rude, S. S., & McCarthy, C. T. (2003). Emotional functioning in depressed and depression-vulnerable college students. *Cognition and Emotion, 17*(5), 799-806.
- Rutter, M. (1989). Temperament: Conceptual issues and clinical implications. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 463-482). West Sussex: John Wiley and Sons.
- Shipman, K. L., Zeman, J. L., & Stegall, S. (2001). Regulating emotionally expressive behavior: Implications of goals and social partner from middle childhood to adolescence. *Child Study Journal, 31*(4), 249-268.
- Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding: Implications for child psychopathology and therapy. *Clinical Psychology Review, 22*, 189-222.
- Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development, 59*(2-3), 25-52.
- Watson, W., Clark, L. A., Weber, K., Assenheimer, J. A., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult, and patient samples. *Journal of Abnormal Psychology, 104*, 15-25.
- Wilhelm, K., Niven, H., Parker, G., & Hadzi-Pavlovic, D. (2005). The stability of the parental bonding instrument over a 20-year period. *Psychological Medicine, 35*(3), 387-393.
- Windle, M. (1992a). Revised Dimensions of Temperament Survey (DOTS-R): Simultaneous group confirmatory factor analysis for adolescent gender groups. *Psychological Assessment, 4*(2), 228-234.
- Windle, M. (1992b). Temperament and social support in adolescence: Interrelations with depressive symptoms and delinquent behaviors. *Journal of Youth and Adolescence, 21*(1), 1-21.
- Windle, M., & Davies, P. T. (1999). Depression and heavy alcohol use among adolescents: Concurrent and prospective relations. *Development and Psychopathology, 11*(4), 823-844.
- Windle, M., Hooker, K., Lerner, K., East, P. L., Lerner, J. V., & Lerner, R. M. (1986). Temperament, perceived competence, and depression in early and late adolescents. *Developmental Psychology, 22*(3), 384-392.
- Windle, M., & Lerner, R. M. (1986). Reassessing the dimensions of temperamental individuality across the life span: The Revised Dimensions of Temperament Survey (DOTS-R). *Journal of Adolescent Research, 1*(2), 213-230.
- Windle, M., & Mason, W. (2004). General and specific predictors of behavioral and emotional problems among adolescents. *Journal of Emotional and Behavioral Disorders, 12*(1), 49-61.
- Zeman, J., Shipman, K., & Suveg, C. (2002). Anger and sadness regulation: Predictions to internalizing and externalizing symptoms in children. *Journal of Clinical Child and Adolescent Psychology, 31*(3), 393-398.

Received 25 February 2007; revised version received 10 April 2008