Measuring emotional intelligence in adolescents

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Abstract

Can emotional intelligence (EI) be reliably and validly measured in adolescents? One-hundred and thirty-one students (aged 13 to 15) completed a self-report measure of emotional intelligence (SEI) [Schutte, N., Malouff, J., Hall, L., Haggerty, D., Cooper, J., Golden, C., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, *25*, 167–177.] and a number of other, theoretically relevant measures. They were then induced into either a positive, negative, or neutral mood and asked to complete a task that assessed mood management behaviour. We found that EI was reliably measured in adolescents, was higher for females than males, and was positively associated with skill at identifying emotional expressions, amount of social support, extent of satisfaction with social support, and mood management behaviour. These relationships held even after controlling for two constructs that potentially overlap with EI, namely self-esteem and trait anxiety. This study offers evidence that the SEI is a distinctive and useful measure. © 2001 Elsevier Science Ltd. All rights reserved.

Many people have come to believe that our notion of intelligence should be expanded to include "emotional intelligence" (EI), which has generally been defined as the ability to perceive, understand, and manage one's emotions (Bar-On, 1997; Ciarrochi, Forgas & Mayer, in press; Cooper & Sawaf, 1997; Goleman, 1995; Mayer & Salovey, 1997; Salovey, Hsee & Mayer, 1993; Salovey & Mayer, 1990). EI has been purported to be distinct from traditional personality and cognitive measures (e.g. IQ) and crucial in predicting many real-life outcomes. With little empirical support, people have claimed that "…emotional intelligence may be the best predictor of success in life, redefining what it means to be smart" (*Time*, 1995, cover). The topic of EI has appeared in a best-seller (Goleman, 1995) and a number of other popular books (Cooper & Sawaf, 1997; Gottman, 1997; Salerno, 1996; Segal, 1997), magazine and newspaper articles (Bennets, 1996; Henig, 1996; Peterson, 1997). Lost in all the excitement is the fact that many of

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the EI measures may be neither reliable nor different from other, well-established measures (Davies, Stankov & Roberts, 1998).

Recently, there has been some evidence that aspects of EI can be reliably measured in adults and can predict important outcomes (e.g. depression) even after controlling for other relevant variables such as IQ and neuroticism (Ciarrochi, Chan & Caputi, 2000; Ciarrochi, Deane & Anderson, 2000; Ciarrochi et al. in press; Mayer, Caruso & Salovey, 1999; Salovey & Mayer, 1990; Schutte et al. 1998). The present paper seeks to establish whether EI can also be reliably and validly measured in young adolescents (aged 13 to 15).

In recent years, there has been an increasing interest in how EI (or emotional competence) develops (Denham, 1998; Eisenberg, Fabes, Murphy, Maszk, Smith & Karbon, 1995; Saarni, 1999; Spirito, Stark, Grace & Stamoulis, 1991). Most of this research has measured EI in young people using performance measures (e.g. face recognition; Cassidy, Parke, Butkovsky & Braungart, 1992; Custrini & Feldman, 1989) and/or observations by peers, parents or teachers (Carlson-Jones & Bowling, 1988; Eisenberg et al., 1995; Saarni, 1999). Surprisingly, little research has examined the usefulness of EI self-report measures in adolescents (cf. Spirito et al.). This lack of research is perhaps justified by the limitations of self-report measures, which include the potential that adolescents will distort their responses (e.g. social desirability) and will not have sufficient insight into their own emotional intelligence to accurately report it. Despite these limitations, we believe that a self-report measure has the potential to be useful because it (1) assesses adolescents' perceived emotional competence, which might be as predictive as actual emotional competence (Ciarrochi, Deane et al. 2000), (2) is quickly and easily measured, and (3) can be used to complement performance and observational measures of EI. The purpose of the present paper is to critically evaluate the distinctiveness and usefulness of a recently developed self-report measure of EI (Schutte et al., 1998).

1. Self-report measures of EI

A number of researchers have attempted to develop self-report measures of EI or EI-related constructs (Bar-On, 1997; Goleman, 1995; Nemiah, Freyberger & Sifneos, 1976; Roger & Najarian, 1989; Salovey & Mayer, 1990; Schutte et al., 1998). While the definitions of EI are often varied, they nevertheless tend to be complementary rather than contradictory. In general, the various measures cover, to more or less extent, four distinct areas: emotion perception, regulation, understanding, and utilization.

One of the earliest explicit formulations of EI was put forth by Salovey and Mayer (1990). They defined EI as the ability to appraise, express, and regulate emotions (in self and others), and the ability to utilise emotions (e.g. to harness emotions to solve problems). Citing a number of difficulties with the then extant EI-related scales, Salovey and Mayer developed the Trait Meta-Mood Scales to measure attention to emotion (e.g. "I don't think it's worth paying attention to your emotions or moods"), emotional clarity ("Sometimes I can't tell what my feelings are"), and emotion repair (e.g. "I try to think good thoughts no matter how badly I feel"). The scales were shown to possess adequate reliability, and the emotional clarity scale successfully predicted ruminative thinking, even after controlling for other measures such as neuroticism and depression (Salovey, Mayer, Goldman, Turvey & Palfai, 1995).

In a recent set of studies, Davies et al. (1998) uncovered a number of problems with the early self-report EI measures. First, some of them had poor reliabilities. Second, the more reliable self-report measures had salient loadings on the well-established personality factors of Neuroticism, Extraversion, Psychoticism, Agreeableness, and Openness. Third, although there is factor-analytic evidence supporting the discriminant validity of two emotional intelligence factors (emotional awareness and clarity), these factors no longer emerge when unreliable measures are dropped from factor analysis.

Schutte et al. (1998) have recently developed a self-report measure of EI (SEI), which seems to avoid some of the problems identified by Davies et al. (1998). The initial evidence suggests that the SEI, in adults at least, may be both reliable and distinct from standard personality factors such as neuroticism and extraversion (Ciarrochi et al. 2000; Schutte et al.). There is also evidence that the EI measure predicts success at university in adults (Schutte et al.) and that a subfactor of the scale (Managing Others' Emotions) predicts how well university students adapt to stress (Ciarrochi, Deane et al.).

Despite this encouraging initial evidence, there are some important unresolved issues surrounding the SEI. First, it is not entirely clear that the SEI provides any incremental value over established measures of self-esteem (Rosenberg, 1965) and trait anxiety (Spielberger, 1983). It may be reasonable, for example, to assume that people who are high in self-esteem will tend to answer positively to such SEI questions as, "I expect I will do well on most things I try," and "When I am faced with obstacles, I remember times I faced similar obstacles and overcame them." It might also be reasonable to assume that people who report having trouble controlling their anxiety (e.g. high trait anxious) will also tend to disagree with an SEI item like "I have control over my emotions". If the SEI is to be valid, it must be shown to be different from other, well-established measures.

The second issue concerns whether the SEI can be applied to young adolescents. The scale requires a reading level typical of fifth graders (Schutte et al., 1998), suggesting that item language will be no problem. Even so, it is possible that adolescents do not yet have a sufficiently good understanding of their own emotional skills to be able to report them accurately on the SEI.

2. Emotion perception

Emotion perception is defined as the ability to discern one's own and others' emotions based on "situational and expressive cues that have some degree of cultural consensus as to their emotional meaning" (Saarni, 1999). A number of studies have examined the role of emotion perception in children's everyday social life (Barth & Bastiani, 1997; Cassidy et al., 1992; Custrini & Feldman, 1989; Saarni, 1999). In one study, Cassidy et al. measured emotion perception and understanding by showing children (in kindergarten or first grade) photographs of people experiencing a discreet emotion, and then asking them a series of questions concerning the emotion being expressed, the sort of situation that might lead to the emotion, and the appropriate responses to the emotion. Cassidy et al. found that children who were good at perceiving and understanding emotions tended to be more accepted by their peers. In a similar study, Custrini and Feldman found that among girls (aged 9 to 12), but not boys, the ability to perceive others' facial expressions was related to the degree of social competence.

In yet another study, Barth and Bastiani (1997) measured both perception accuracy and perception bias in young children (aged 4 to 5) by presenting them with facial expressions of classmates (who were told to produce one of five different emotions) and having them identify the emotion being expressed. The researchers then calculated an accuracy score based on the congruence between the judged expression and the expression the classmate was intending to produce. A bias score was also calculated, and this was based on the proportionate number of times a child used a particular expression label relative to the total number of classmate photos that were being judged. Barth and Bastiani found that bias scores were more strongly related than accuracy scores to unsatisfactory peer relationships. This pattern was especially pronounced if the bias was for seeing angry facial expressions, even if that was not what the classmate was trying to express.

The studies discussed in this section have demonstrated that the extent young people are accepted by their peers is associated with higher emotion perception, as assessed by a performance measure (e.g. identify the emotion in the face). We will extend these findings by examining whether or not self-reported emotion perception skill also relates to the quality of social relationships among adolescents.

3. Skill at managing other's emotions

This skill includes the ability to arrange events others enjoy, hide negative emotions in order to avoid hurting another person's feelings, and make others feel better when they are down. For example, Saarni (1984) conducted a study that examined children's (aged 6 to 11) ability to look agreeable when someone gave them a gift they did not like. Children received a dull and inappropriate baby toy and were videotaped unwrapping the toy and interacting with a market researcher. Saarni (1984) found that 6-year-old boys showed uniformly negative expressive behaviour, the youngest girls and both boys and girls of 8 and 9 years old showed transitional behaviour (neither particularly negative nor positive), and the oldest children (especially the girls) showed the most positive behaviour towards the market researcher, despite receiving a "dumb" toy. In another study investigating skill at managing others' emotions, McCoy and Masters (1985) interviewed children (aged 5 to 12) in response to a series of slides depicting other children displaying assorted emotions. Children were asked what they would do to make the other person not feel the way they were feeling. The results suggested that older children tended to use social and verbal nurturance, whereas younger children used more material nurturance.

These studies suggest that young children can hide their emotions in order to make others feel better and can readily articulate ways to alter someone's affective state. They also illustrate useful but somewhat time-consuming ways of measuring skill at managing others' emotions. We will investigate the possibility that, at least by early adolescence, skill at managing others' emotions can be assessed using a short, reliable self-report measure.

4. Skill at managing self-relevant emotions

This skill involves the capacity for adaptively coping with aversive or distressing emotions by using self-regulatory strategies that ameliorate the intensity or duration of such emotional states (Saarni, 1999). A substantial amount of work has examined how young people cope with stressful

life events (Aldwin, 1994; Compas, 1987; Saani, 1999; Spirito et al., 1991). Much of this work has focused on the style of coping (e.g. "problem versus emotion focused coping") and effectiveness of particular coping strategies. For example, Spirito et al. presented young people (aged 9 to 13) with a list of common stressful events, and asked them to describe what coping strategies they used and how effective they believed the coping strategy to be. They found that younger partici-pants (aged 9–11) used certain coping strategies (e.g. cognitive restructuring, wishful thinking) more often than did older participants (aged 14). Other studies have used parent and teacher reports to assess emotion management skill and have found the reports to be related to young people's social competence (Eisenberg et al., 1995).

A goal of the present paper is to examine whether adolescents who report being good at managing self-relevant emotions are in fact better at managing experimentally-induced positive and negative moods. A second goal is to examine whether self-reported emotion management skill is better at predicting mood management behaviour than self-esteem and trait anxiety, two well-validated measures that have already been shown to predict mood management behaviour (Boden & Baumeister, 1997; Smith & Petty, 1995).

5. Overview

Our primary goal was to establish whether a self-report measure of EI could be used reliably and validly with adolescents. If the SEI is a valid measure, then it ought to relate to a number of criterion measures: First, we expected EI to relate to the amount and quality of social support. Specifically, people who are high in EI should be better at establishing and maintaining close relationships; and, to reverse this logic, people with highly supportive, close relationships should have higher EI (see Saarni, 1999). Second, we expected EI to relate to family warmth. Adolescents from communicative, warm families ought to be better than others at perceiving and managing their emotions (Mayer et al., 1999). Third, we expected EI, and self-reported emotion perception in particular, to relate to the ability to recognise emotions in faces. Fourth, we expected EI to relate to gender, which would be consistent with the substantial amount of evidence suggesting that females are more emotionally competent than males (Ciarrochi, Chan et al. 2000; Mayer et al., 1999; Wer-tlieb, Weigel, & Feldstein, 1987; Weirzbicki, 1989). Fifth, we expected self-reported skill at managing one's own emotions to relate to adolescents' ability to manage an experimentally-induced mood.

In order to show that the SEI is a valid measure, we will need to demonstrate that it not only is related to criterion measures but also that it is sufficiently different from other, well-established variables. We sought to establish whether SEI predicted variance in the criterion variables even after controlling for the related constructs of self-esteem and trait anxiety.

6. Methods

6.1. Subjects and procedure

One-hundred and thirty-one adolescents (73 males, 58 females; aged 13 to 15; $M_{age} = 13.8$, S.D. $= 0.74$) from Years 8 and 9 of three different Catholic schools volunteered to participate in

the study. We found no differences in effects across schools or age groups, so all data were collapsed across these categories. Participants were conducted in groups of 4 to 7 through the protocol, which involved first measuring all the personality and criterion variables and then administering the mood management task (see below).

6.2. Self-report emotional intelligence (33-item scale)

The self-report questionnaire by Schutte et al. (1998) comprises 33 self-referencing statements and requires subjects to rate the extent they agree or disagree with each statement on a five-point scale (1 = strongly disagree; 5 = strongly agree). Recent factor analytic studies have established that all the items load significantly on a single factor (Schutte et al.), which we call Overall EI. More recent research has established that Overall EI can be further broken down into four factors (Ciarrochi, Deane, & Anderson, in press; Petrides & Furnham, 2000)[1]. The perception factor (10 items) consists of statements such as "I find it hard to understand the non-verbal messages of other people", and "I am aware of my emotions as I experience them." The Managing Self-Relevant Emotions factor (nine items) consists of items such as "I motivate myself by imagining a good outcome to tasks I take on" and "I seek out activities that make me happy." The Managing Others' Emotions factor (eight items) consists of items such as "I arrange events others enjoy", "I compliment others when they have done something well", and "I know when to speak about my personal problems to others". This third factor might also be labelled "social skills" (Petrides & Furnham), but we chose Managing Others' Emotions because the items refer to actions that would tend to maintain or increase other people's positive moods. There is a fourth emotion utilization factor (four items; "When I feel a change in emotion, I tend to come up with new ideas"), but it has demonstrated low reliability in past studies (e.g. $\alpha = 0.58$; Ciarrochi, Deane et al. 2000). The overall EI variable included the utilization items, the perception and emotion management items, and two other items that do not load clearly on any one of the factors.

6.3. Criterion measures

The self-esteem scale (Rosenberg, 1965) consisted of 10 self-relevant statements (e.g. "At times I think I am no good at all") and participants rated the extent the item most accurately describes them on a nine-point scale ranging from very strongly disagree (−4) to very strongly agree. The trait anxiety scale (Spielberger, 1983) consisted of 20 statements regarding participants' general level of anxiety (e.g. "I feel nervous and restless"), and participants indicated the extent they generally felt what was described in the statement on a four-point scale, ranging from almost

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[1] There were two minor differences between the Ciarrochi, Deane, & Anderson (in press) (2001) and the Petrides and Furnham (2000) studies. Item 6 (see Schutte et al., 1998) loaded on the managing others' emotions (or social skills) factor in the Petrides and Furnham Analysis but not the Ciarrochi, Deane, & Anderson (in press) (2001) analysis, so this item was dropped from the managing others' emotions variable. Also, item 33 loaded heavily on the perception factor in the Petrides and Fuhrnham analysis, loaded the highest on the perception factor in the Ciarrochi analyses, and its item content was clearly related to emotion perception ("It is difficult for me to understand why people feel the way they do"). Consequently, it was added to the emotion perception variable.

never (1) to almost always (4). Both self-esteem and trait anxiety were shown to be reliable in our sample, $\alpha = 0.86$ and 0.89, respectively.

Social support was measured using a 12-item version of the Social Support Questionnaire (Sarason, Levine, Basham & Sarason, 1983). Participants were given statements such as, "Who can you count on to listen openly and uncritically to your innermost feelings?", and were asked to list the initials and relationship (e.g. brother) of the relevant people who could provide them with support. After listing the sources of help, participants were asked to rate how satisfied they felt with the overall support, with responses ranging on a six-point scale from very dissatisfied (1) to very satisfied (6). In the present adolescent sample, the reduced social support measure was shown to reliably measure both amount of, and satisfaction with social support, $\alpha = 0.91$ and 0.92, respectively. The parental warmth questionnaire (Mayer et al., 1999) presented seven statements asking participants the extent that their parents were "warm", "listened to them", "were non-abusive", "yelled", "were strict", "enjoyed talking to them", and "were cold and distant". The scale was reliable in the present sample, $\alpha = 0.71$. The face recognition task (Mayer et al. 1999) presented participants with eight coloured photographs of faces expressing a variety of emotions, and asked participants to identify the extent that specific emotions (happiness, anger, fear, sadness, disgust, and surprise) were present in the face (from 1 = definitely not present to 5 = definitely present). The scale is scored based on Mayer et al.'s (1999) norms, and was reliable in the present sample, $\alpha = 0.82$.

6.4. Mood induction and story composition task

The task used in the present study has been used successfully by Smith and Petty (1995) to examine the role of self-esteem in mood management behaviour. Participants were first presented with an affect-eliciting short film (approximately 8 min in length). The positive film was taken from a popular comedy series, "Fawlty Towers", the neutral film consisted of a documentary about the capital of Australia, and the negative segment consisted of a documentary about children who survived the holocaust. All films had been used successfully in past research (e.g. Ciarrochi & Forgas, 1999; Forgas, 1991, Forgas, 1998) and have been shown to reliably induce moods. Following the mood induction, participants were asked to view a projective stimulus picture taken from the Thematic Apperception Test (Murray, 1943). The item depicted a male

Table 1
Correlations between EI subscales and self-esteem and trait anxiety[a]

	EI variables					Other variables	
	Overall EI	Regulate self	Regulate others	Perceive	Utilise	Self esteem	Trait anxiety
Overall EI	–	0.69**	0.79**	0.76**	0.56**	0.41**	−0.43**
Regulate self		–	0.48**	0.28**	0.28**	0.51**	−0.49**
Regulate others			–	0.46**	0.33**	0.28**	−0.33**
Perceive				–	0.29**	0.22*	−0.21*
Utilise					–	0.15	−0.14
Self-esteem						–	−0.76**

[a] **$P < 0.01$, * $P < 0.05$

figure looking out of a window in a dark room. Participants were asked to compose a short story in their booklets based on this picture. The stories were rated independently in terms of their positivity by two judges (1 = highly negative, 5 = highly positive), who achieved satisfactory inter-rater reliability, $r(131) = 0.76$.

After completing the stories, participants were asked to rate how they felt after viewing the movie on six 5-point scales (1 = not at all; five = extremely), anchored by the following emotion words: "happy", "sad", "pleasant", "negative", "angry", and "nervous". Factor analysis revealed that the first five items loaded on a single negative mood factor (all loadings greater than an absolute value of 0.75). Consequently, these items were averaged together to form a single, self-reported mood scale. The sixth item, nervous, was analyzed separately below.

7. Results

7.1. Preliminary analyses

We examined whether EI could be reliably measured in adolescents. The reliabilities were satisfactory for overall EI ($\alpha = 0.84$) and perception ($\alpha = 0.76$), were satisfactory but somewhat lower than is desirable for Managing Others' Emotions ($\alpha = 0.66$) and Managing Self-Relevant Emotions ($\alpha = 0.63$). Reliability was too low for utilizing emotions ($\alpha = 0.55$). These reliabilities are similar to those obtained in an adult sample (Ciarrochi, Deane et al. 2000), with the exception that Managing Self-Relevant Emotions was measured somewhat more reliably in adults ($\alpha = 0.78$). The average scores for each of the EI subscales were as follows: Overall EI, $M = 3.65$, S.D. = 0.42, perceiving emotions, $M = 3.57$, S.D. = 0.58, managing other's emotions, $M = 3.63$, S.D. = 0.58, managing own emotions, M = 3.71, S.D. = 0.52, and utilizing emotions, $M = 3.69$, S.D. = 0.66.

We next tested our hypothesis that EI significantly overlaps with both trait anxiety and self-esteem. As can be seen in Table 1, all EI variables (except the unreliable utilization factor) correlate with self-esteem and trait anxiety. These correlations are especially high between regulating self and self-esteem and trait anxiety, and are somewhat lower between emotion perception and trait anxiety and self-esteem.

7.2. Sex effects

As expected, females reported having greater overall EI than males, $F(1,128) = 23.7$ ($M_{males} = 3.50$, $M_{females} = 3.84$), and greater skill at perceiving emotions, $F(1,128) = 16.87$ ($M_{males} = 3.39$, $M_{females} = 3.79$), regulating the emotions of others, $F(1,128) = 33.30$ ($M_{males} = 3.4$, $M_{females} = 3.90$) and utilizing emotions, $F(1,128) = 4.37$ ($M_{males} = 3.58$, $M_{females} = 3.82$), all Ps < 0.05. However, females did not express more skill at regulating their own emotions, $F(1,128) = 0.84$ ($M_{males} = 3.68$, $M_{females} = 3.76$). Women also reported more social support from friends, $F(1,128) = 14.58$ ($M_{males} = 1.00$, $M_{females} = 1.70$), and were more satisfied with their social support, $F(1,128) = 4.13$ ($M_{males} = 4.8$, $M_{females} = 5.1$), Ps < 0.05. There were no other sex differences. In all analyses described below, we found no evidence that sex qualified the magnitude of the reported correlations or beta coefficients, so all remaining analysis were collapsed across gender.

7.3. EI and Criterion measures

We next investigated the extent that EI, self-esteem, and trait-anxiety correlate with our criterion measures (see Table 2). As expected, overall EI was significantly correlated with amount of social support, satisfaction with social support, parental warmth, and face recognition. The subfactors of EI also tended to correlate significantly with the social support variables and parental warmth (with the exception of the unreliable utilization actor), but the subfactors did not correlate with face recognition.

In general, however, the results do suggest that EI is correlated in the expected direction with the criterion measures. Self-esteem and trait anxiety also tend to correlate with all the criterion measures except facial expression recognition.

To assess the discriminant value of the EI measure, we examined the relationship between EI and the criterion measures after controlling for self-esteem and trait anxiety. As can be seen in Table 3, EI did still significantly relate with amount of social support, satisfaction with social

Table 2
The relationship between EI, self-esteem, and trait anxiety, and the criterion measures[a]

	EI variables					Other variables	
	Overall EI	Regulate self	Regulate others	Perception	Utilisation	Self-esteem	Trait anxiety
Social Support							
Friends	0.26**	0.09	0.30**	0.21*	0.05	0.01	−0.11
Parents	0.23**	0.22*	0.23*	0.11	0.12	0.26*	−0.38**
Extended family	0.36**	0.27**	0.30**	0.27**	0.16	0.19*	−0.22*
Siblings	0.08	−0.06	0.12	0.09	0.07	−0.03	0.05
Satisfaction	0.44**	0.43**	0.41**	0.27**	0.19*	0.36**	−0.52**
Parental warmth	0.19*	0.23**	0.20*	0.04	0.06	0.33**	−0.38**
Face recognition	0.18*	0.10	0.12	0.10	0.11	0.04	−0.04

[a] * $P < 0.05$, ** $P < .01$

Table 3
Partial correlations between amount of social support, satisfaction with social support, and facets of emotional intelligence while controlling for Self Esteem and Trait Anxiety[a]

	Overall EI	Regulate self	Regulate others	Emotion perception	Emotion utilisation
Social support					
Friends	0.27**	0.08	0.29**	0.22*	0.04
Parents	0.03	0.07	0.14	0.03	0.07
Extended family	0.28**	0.17*	0.23**	0.21*	0.13
Siblings	0.12	−0.03	0.15	0.11	0.07
Satisfaction	0.30**	0.27**	0.31**	0.22*	0.14
Parental warmth	0.02	0.04	0.08	−0.06	0.00
Face recognition	0.19*	0.11	0.13	0.11	0.11

[a] * $P < 0.05$, ** $P < 0.01$

support, and face recognition, but was no longer significantly related to parental warmth. Interestingly, it was the amount of social support from friends and from the extended family that was most related to EI, whereas amount of support from parents and siblings was not.

7.4. EI and mood regulation

We investigated the possibility that self-reported emotion regulation (of the self) moderates the relationship between mood and mood-management behavior. We expected that people both low and high in regulation would respond similarly to the mood induction, but that high regulators would tend to respond with more positive story generations in an attempt to repair their bad moods or/and maintain their good moods. Following the procedure outlined by Aiken and West (1991) for testing interactions (or moderation effects) involving continuous variables, we converted all continuous variables to z scores and dummy coded the mood variable. We then used mood induction (positive, negative, and neutral), Managing Self-Relevant Emotions, the interaction between mood and emotion regulation, self-esteem, and trait anxiety as covariates in a general linear model (GLM) ANOVA to predict self-reported negative mood and nervousness, and to predict the positivity of story generations.

As expected, there was a highly significant effect of mood on self-reported negative mood, $F(2,121) = 150.80$, $P < 0.001$, and this effect was not qualified by an interaction with Managing Self-Relevant Emotions, $F(2,121) = 1.76$, $P > 0.1$. There were no significant effects of the mood induction on nervousness, all $Ps > 0.1$. Planned contrasts revealed that the negative mood induction led to significantly more negative self-reported mood ($M = 4.22$, S.E. $= 0.11$) than the neutral ($M = 2.52$, S.E. $= 0.11$) and positive ($M = 1.73$, S.E. $= 0.09$) mood induction, $t(121) = 11.20$, $P < 0.01$, $t(122) = 17.62$, $P < 0.01$, respectively, and the neutral mood induction led to significantly more negative reported mood than the positive mood induction, $t(121) = 5.56$, $P < 0.01$. Thus, the inductions were effective in inducing positive, neutral, and negative moods, and had the same effect on people low and high in Managing Self-Relevant Emotions.

Turning to the story generation task, we found a significant main effect of mood on the positivity of story generation, $F(2,121) = 4.81$, $P < 0.05$, but as expected, this effect was qualified by an interaction with Managing Self-Relevant Emotions, $F(2,121) = 3.57$, $P < 0.05$. To explore the interaction further, we followed the suggestion of Aiken and West (1991) and substituted z score values of -1 (low emotion management) and $+1$ (high emotion management) into the emotion management variable in the regression model and generated the simple effects of mood at each level of emotion regulation. As expected, participants high in emotion regulation tended to generate significantly more positive stories in a positive ($M = 3.1$) compared to a neutral mood ($M = 2.18$), $t(121) = 2.47$, $P < 0.05$, but did not generate significantly more negative stories in a negative ($M = 1.98$) compared to the neutral mood. People low in emotion regulation, in contrast, did not generate significantly more positive stories in a positive ($M = 2.7$) compared to the neutral mood ($M = 3.2$), $t(121) = -1.36$, $P > 0.1$, but did generate significantly more negative stories ($M = 2.2$) compared with the neutral mood group, $t(121) = -2.65$, $P < 0.01$. Analyses were also conducted to examine if any of the other EI subfactors and personality variables influenced mood management behaviour. No additional effects were found.

8. Discussion

The results of the present study support the proposition that adolescents can reliably and validly report their own levels of EI. The overall EI measure was highly reliable, and the perception and managing emotions subscales achieved adequate (though not ideal) levels of reliability. As expected, EI was related to sex, facial expression recognition, family warmth, amount of social support, and satisfaction with social support. EI, and Managing Self-Relevant Emotions in particular, was also related to a pattern of results on the story generation task that is consistent with the prediction that people high in Managing Self-Relevant Emotions would engage in more mood regulation behaviour. Unexpectedly, though, emotion perception was not related to face recognition, whereas the overall EI variable was. The relationship between the EI variables and most of the criterion measures held even after controlling for self-esteem and trait anxiety, which provides some evidence that the SEI has incremental value over these variables.

8.1. Social support

We expected that people high in EI would be better able to establish and maintain close personal relationships and social support (Saarni, 1999), and that people with close, supportive relationships would also have higher EI. As expected, we found that emotion management and emotion perception were related to the amount of, and satisfaction with social support. However, these relationships depended on the source of support. Support from friends and extended family were more strongly related to EI than support from siblings and parents. This effect may reflect important differences in sources of support, but it might also reflect a statistical artifact: There is a restricted range in the number of siblings (usually 0 to 4) and parents (usually 1 to 2) that can provide social support, but less of a restricted range in the number of potential friends and extended family members one can have. Such a restricted range might reduce the chance of obtaining a significant correlation (Kleinbaum, Kupper & Muller, 1988). Inconsistent with this view, we found that the amount of parental support was associated with EI before controlling for self-esteem and trait anxiety. This effect at least establishes the possibility of obtaining a significant correlation involving parental support.

What can be said about the relationship between EI and the family environment? Both parental warmth and amount of parental support were associated with higher emotion management skill but were also associated with higher self-esteem and lower trait anxiety. After controlling for these latter two variables, the relationships between EI and these parenting variables were nonsignificant. This pattern of findings suggests that parental support and warmth may be important to the development of emotion management skill but only indirectly through its influence on increasing self-esteem and reducing trait anxiety. That is, a supportive home environment may produce confident, non-anxious adolescents, who are then better able to regulate their own and others' emotions. Future research is needed to determine if this causal hypothesis is correct.

8.2. Face recognition

We hypothesized that adolescents who report having higher emotional intelligence would be better able to identify facial expressions. We found that overall EI was related to face recognition, but we did not find that any of the subfactors of this overall variable were related. This was

somewhat surprising, because we expected that the perception subfactor would be more related than the other factors to face recognition. This finding, however, is not inconsistent with a recent study with adults which also found that self-reported emotion perception was not related to actual emotion perception (Ciarrochi, Deane et al., 2000). This finding suggests that adults and adolescents may not be able to accurately report their emotion perception skill. Alternatively, it may be that the perception skill measured in self-reports is fundamentally different from the sort of skill measured in the face recognition task. Further research will be needed to resolve this issue. The finding that overall self-reported EI did relate to actual face recognition does suggest that adolescents have some understanding of their own level of emotion perception skill.

8.3. Sex

We hypothesized that females would report higher levels of EI than males, which would be consistent with a number of previous studies (Ciarrochi, Chan et al., 2000; Wertlieb et al. 1987; Wierzbicki, 1989). Females did report being better at managing others' emotions and perceiving emotions but did not report being better at managing their own emotions. This lack of difference in perceived emotion management skill is somewhat inconsistent with previous coping research which suggests that females respond more adaptively to some stressors than males, being more willing to seek help from others and use emotion-focused strategies when these are most appropriate (Deane, Wilson & Ciarrochi, in press; Wierzbicki; Wertlieb et al.). It is possible, then, that females underestimate their mood management ability, or perhaps that males overestimate theirs. These possibilities should be explored in future research.

8.4. Mood regulation

To what extent does the SEI, and Managing Self-Relevant Emotions in particular, relate to actual mood management behaviour? We found that adolescents low and high in Managing Self-Relevant Emotions reported the same level of positive and negative moods in response to the movie mood inductions. However, their behaviour in response to these moods differed. As predicted, adolescents high in Managing Self-Relevant Emotions were more likely to generate positive stories when in either a negative mood (consistent with mood repair) or a positive mood (consistent with mood maintenance or mood congruent recall). This difference cannot be explained simply by assuming people high in Managing Self-Relevant Emotions generally generate positive stories, since such people did not generate more positive stories in the neutral condition. The pattern of results observed here for adolescents is consistent with that observed for adults (Ciarrochi, Chan et al., 2000), and supports the prediction that Managing Self-Relevant Emotions is related to actual mood management behaviour.

Is it possible that our mood management effects can be explained in terms of self-esteem or trait anxiety? Managing Self-Relevant Emotions is associated with self-esteem and trait anxiety, and there is evidence that people high in self-esteem or low in trait anxiety are more likely to regulate their emotions in a positive direction (MacLeod & Mathews, 1988; Smith & Petty, 1995). However, neither trait anxiety nor self-esteem interacted with mood to predict the positivity of story generation. Indeed, the interaction between mood and emotion management was significant even after controlling for self-esteem and trait anxiety, suggesting that Managing Self-Relevant Emotions shows incremental value over these variables.

8.5. Limitations and future directions

This study showed that one self-report measure of EI could be used to reliably assess overall EI and emotion perception, and could achieve reasonable, though not ideal, levels of reliability for the mood management subfactors. Future research should attempt to improve the mood management reliabilities perhaps by adding additional or more sensitive items. This study also showed that the EI variables were related in expected ways to criterion variables, even after controlling for two related constructs, self-esteem and trait anxiety. However, it is still possible that the SEI is not sufficiently different from other well-established variables not included in our study. Future research is needed to further establish the discriminant validity of the SEI, though the present findings and those in other studies are encouraging (e.g. Schutte et al., 1998; Ciarrochi, Chan et al., 2000; Ciarrochi, Deane et al., 2000).

Another issue relates to the range and quality of the moods induced here in examining mood management behaviour. In common with much of the earlier research on mood effects on cognition and judgments (Smith & Petty, 1995), these studies examined the effects of EI and non-specific, undifferentiated good or bad moods on story generation. It will be interesting for future research to examine if EI moderates the impact of specific emotions, such as joy, fear, and anger, on mood management behaviour (Berkowitz, 1993). Another issue relates to the finding that adolescents high in Managing Self-Relevant Emotions tended to generate more negative stories in the neutral condition than those low in Managing Self-Relevant Emotions. This finding is similar to that found in adults (Ciarrochi, Chan et al., 2000), and is not explainable in terms of differences in level of mood in the neutral condition. It may be that high EI people are more open than others to a range of negative feelings and emotions, and are therefore more likely to think of and recall negative stories when in a neutral mood. Future research should investigate this possibility.

9. Conclusions

It has been clear for a number of decades that children face serious peer relationship and mental health problems (Asher & Rose, 1997; Salovey & Sluyter, 1997). There is now some hope among educators and mental health practitioners that skills related to EI can be identified and possibly taught to adolescents, and that such skills may help to protect them from the emotional difficulties of everyday life (Ciarrochi et al., in press; Salovey & Sluyter). However, before investing substantial money in EI training programs, it is essential to establish that EI is a distinctive and important construct. To do so, one must establish that EI can be reliably measured and can predict important criteria over and above other well-established measures. The present study suggests that a self-report measure of EI may be reliable, distinctive, and useful. Further research into EI is certainly warranted.

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