


# Emotional Intelligence and Education: A critical review

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In recent years there has been an increased interest in the role of emotional intelligence in both the academic success of students and their emotional adjustment in school. However, promotion of emotional intelligence in schools has proven a controversial pursuit, challenging as it does traditional “rationalist” views of education. Furthermore, research findings in this area have been inconsistent at best. In this article we discuss the following key questions relating to this important debate. What do we mean by emotional “intelligence”? What impact would improved emotional intelligence have on learners’ emotional health and well-being, academic achievement, and other adaptive outcomes? Can emotional intelligence be taught? It is felt that these are the key issues for consideration in developing policy, practice, and further research in this area. 

## Introduction

导论：为什么情商教育会受到越来越多的关注主要是因为当今社会的需要。


In recent years there has been an increased interest in the role of emotional intelligence in both the academic success of students and their emotional adjustment in school. Indeed, some authors (Romasz, Kantor, & Elias, 2004) suggest that acquisition of such skills are a prerequisite for students before they can access traditional academic material presented in the classroom. Furthermore, an increasing number of authors have argued that the current demands of society require additional skills in the areas of emotional awareness, decision-making, social interaction, and conflict resolution if children are going to go on to successful adult lives (Romasz et al., 2004). It is becoming evident that general success and well-being in adulthood can be contingent upon learning how to employ these social and emotional learning skills to negotiate life’s many challenges productively, in order to reduce the risk of

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mental health problems (Cherniss & Adler, 2000). These ideas challenge the more traditional view that the purpose of education is to teach core curriculum subjects and that this knowledge alone will equip students to meet the challenges they will face as adults. However, this paradigm shift has courted considerable controversy, with some authors (e.g., Barchard, 2003) denouncing the emotional intelligence movement and its empirical base. In this article we aim to critically examine some of the key issues in this area. We begin by exploring the **historical conflict** that underpins much of the contention. A discussion of the literature then follows, focusing on three key questions: What do we mean by emotional “intelligence”? What impact would improved emotional intelligence have on learners’ emotional health and well-being, academic achievement, and other adaptive outcomes? Can emotional intelligence be taught? It is felt that these are the key issues for consideration in developing policy, practice, and further research in this area.

### The Historical Conflict between Emotion and Reason 情感与理性的历史争论

Education should encompass both the rational and the emotional to best prepare our children for adult life. An understanding of what is meant by the term “emotions” can be drawn from Salovey and Mayer (2004), who suggest we can view them as:

organised responses, crossing the boundaries of many psychological subsystems, including the physiological, cognitive, motivational, and experiential systems. Emotions typically arise in response to an event, either internal or external, that has a positively or negatively valenced meaning for the individual. Emotions can be distinguished from the closely related concept of **mood** in that emotions are shorter and generally more intense. (pp. 2–3) 

By contrast, “rationality” is used to refer to “that which is characterized by conformity with reason, adhering to qualities of thought such as intelligibility, coherence, consistency, order, logical structure, completeness, testability, and simplicity” (Australian Theological Forum, 2006). Historically, there has been considerable conflict between these two modes of thinking; indeed, the very use of the term “emotional intelligence”, in which “emotion” and “reason” are drawn together (see next section), is viewed by some as an oxymoron (Salovey & Mayer, 2004). To the rational mind, emotion has commonly been associated with the fear that it contributes strongly towards irrational behaviour (McPhail, 2004). This construes the expression of emotion as potentially distorting and dangerous. Where this is particularly of concern is in the professions, though obviously these fears apply to most areas of living within society. Professional bodies (such as the teaching profession) and corporate structures have become historically associated with being “sites of instrumental rationality” (Barbalet, 2001; Bolton, 2000; Hanoch, 2002a, 2002b). It can be argued that this rationalist view in professional life has led to a disproportionate focus on the cognitive characteristics of professional decision-making, ignoring the potential role of the emotions in even the most diehard instances of rationalized decision-making (Bolton, 2000; Hanoch, 2002b; McPhail, 2004). The rationalist

viewpoint has in fact taken the extreme position that cognition and emotion are two disparate and diametrically opposed entities (Bolton, 2000; Hanoch, 2002b). This, combined with the rationalist belief that emotion will somehow produce irrational decisions, has placed emotion in an inferior position to cognition in the professional and educational fields (McPhail, 2004). **对情感的误读**

Recently the role of emotion as a second-rate and confusing human attribute, to be suppressed and overridden by cognition, has been challenged in the literature on **organizational studies** (Etzioni, 1988; Hochschild, 1983), **economic psychology** (Hanoch, 2002a, 2002b), and **leadership** (Bolton, 2000; Peters & Austin, 1985). Within these strongly rationalistic fields, an increasing number of authors have argued for an acceptance of the emotional content of work and the introduction of an emotional element into bounded reality (Bolton, 2000; Fineman, 1993; Hanoch, 2002a, 2002b; Hochschild, 1983; Zapf, 2002). It is from this literature that **a model of the interconnectedness of emotion and reason is being developed** (Makanasy, Hartel, & Daus, 2002; Bolton, 2000; Damasio, 1994; Hanoch, 2002a, 2002b; McPhail, 2004). This model has been taken further forward by new decision-making theory, which suggests that emotion enables reason to function (Ben-Ze'ev, 2000; Damasio, 1994; Hanoch, 2002a, 2002b). This is strongly supported by the literature from the last two decades on the function of the nervous system, which has shown that the control of one of the main neurochemicals to facilitate cognition, dopamine, is predominantly under the auspices of the emotional system of the brain, the limbic system (Ljungberg, Apicella, & Schultz, 1992; Mirenowicz & Schultz, 1994; Phillips, 1984; Schultz, 1998; Schultz & Romo, 1990; Schultz et al., 1995).

In breaking down how emotion can help reason to function, four main points should be made, as follows: **情感如何帮助发挥理性：**

1. Emotions are neutral. They contain information which needs to be recognized and understood in order to inform decision-making (Damasio, 1994).
2. Emotion can be seen as being central to individuals' ability to establish which problems they should solve and in which order they should address them (McPhail, 2004).
3. Emotion helps individuals to identify the elements that reason must take into account when a decision is being made (De Sousa, 1990).
4. Emotion can be seen as establishing appropriate goals towards which reason can work.

In short, emotions first filter incoming information to restrict the range of possibilities to be evaluated, and secondly focus our attention on particular aspects of the information that should be taken into account when decisions are being made (McPhail, 2004). This closely parallels our understanding of brain physiology and especially the control of dopamine release. As has been mentioned above, this control comes predominantly from the emotional system in the brain, the limbic system (Ljungberg et al., 1992; Mirenowicz & Schultz, 1994; Phillips, 1984; Schultz, 1998; Schultz & Romo, 1990; Schultz et al., 1995). Dopamine is centrally involved in our cognitive and attentional systems (Kahkonen et al., 2002; Knutson

et al., 2004; Nieoullon, 2002; Overtom et al., 2003). Dopamine release first switches our attentional system (as described by Posner & Petersen, 1990) to a particular stimulus and then facilitates cognitive activation through its release in the frontal brain (Arnsten, Cai, Murphy, & Goldman-Rakic, 1994; Goldman-Rakic, 1998; Groenewegen & Uylings, 2000), before finally facilitating the passage of relevant information throughout the brain (Calabresi, Centonze, & Bernardi, 2000; Conti et al., 2001; Hollerman, Tremblay, & Schultz, 2000) and establishing learning (Calon et al., 2000; Kerr & Wickens, 2001; Ljungberg, Apicella, & Schultz, 1992; Myslivecek, 1997). This understanding of the brain's basic functioning concurs exactly with McPhail's conclusion, reached through different routes, that "the exclusion of emotion from... rational decision making is quite literally impossible" (McPhail, 2004, p. 635).

The other side of this coin is seen when emotions are **uncontrolled**. At high levels of excitation, the amygdala, our most primitive emotional structure, concerned predominantly with flight- or fight-type reactions (Joseph, 1999; LeDoux, 1998), is capable of short-circuiting the higher brain centres and so removing cognition from behaviour (LeDoux, 1998). In extreme circumstances this promotes near-instantaneous reactions to remove oneself from an immediate threat, but this mechanism presumably operates to a greater or lesser degree in any situation of perceived threat. In stressful circumstances, therefore, high levels of emotional activation can interfere with intellectual performance, as has been shown to be the case (Axline, 1965; Baruch, 1952; Hutt, 1947).

The conclusion to be drawn from the above points seems to be that **if emotion cannot be removed from (and is central to) rational thought processes, then the more an individual has developed their emotional intelligence, the better their decision-making should be**. This concept is best illustrated by a body of work which has shown that individuals with an absence of a strong sense of self and sound decision-making skills are susceptible to peer pressure, particularly in the area of drug use and sexual activity (Romasz et al., 2004). Taken in the broader field of education, "decision" becomes synonymous with "life choices", from the smallest to the largest.

In summary, following a historical conflict that dates back to ancient Greece (Mayer, Salovey, & Caruso, 2000), a modern view of emotion and reason as interacting, interdependent constructs has emerged. Although the reasons for this renaissance of emotion are undoubtedly several and varied, they can arguably be traced primarily to parallel developments in psychological theory (Eich & Schooler, 2000) and neuroscience (Damasio, 1994). The **materialization** of emotional intelligence in the modern *Zeitgeist* can therefore be seen as a primary outcome of this amalgamation.

### **What Do We Mean by Emotional Intelligence?**


A significant problem in the development of this area of psychology has been the clear operational definition of the construct to be studied. Clear definition is a basic scientific requirement, yet this has so far eluded emotional intelligence. The following subsections highlight what we believe to be the key definitional issues.

*Emotional Intelligence, Literacy, or Competence?*

情商是一种基本素养还是能力？  
(讨论定义)

An initial quandary is that “emotional intelligence” is one of a multitude of terms that are often used interchangeably in this body of literature. Among its common aliases are “emotional literacy” and “emotional competence”. Although there are salient arguments for the differentiation of these terms (e.g., Weare & Gray, 2003), we feel it is more pertinent to arrive at a common conceptual definition, if only because there is not enough clear evidence that they describe qualitatively different ideas. Furthermore, if progress is to be made in this area, there is a distinct need to adopt a common language that researchers and practitioners alike can adhere to. Thus, we refer to emotional intelligence as a collective term that incorporates “emotional literacy” and “emotional competence”. The rationale for this is given below:

- The term “emotional intelligence” is arguably the most widely used and understood term of reference, and is in keeping with the major theoretical models in this area (e.g., Gardner, Kornhaber, & Wake, 1995; Goleman, 1995; Salovey & Mayer, 1990).
- The metaphors implied in the words “literacy” and “competence” can be confusing. With regard to the former, a unitary construct is often implied (as opposed to a cluster of competencies), which can be unhelpful. For the latter, little meaning is held for sectors other than education.
- The term “intelligence” can be validated by reference to a discrete set of criteria (see below). By contrast, it is rather more difficult to arrive at a clear understanding of what constitutes “literacy” or “competence” in this context.
- Related to the above, the use of the term “intelligence” implies that the attributes under scrutiny are distinct and measurable, providing a solid basis for empirical inquiry in this area.

Use of the term “intelligence” carries its own **disadvantages**, of which two are of paramount concern. First, it has been argued that the term implies a capacity that is innate and fixed (and hence not amenable to educational influence) (Weare & Gray, 2003). However, this view is somewhat out of step with modern conceptions of intelligence (e.g., Neisser, Boodoo, Bouchard, Boykin, Brody, Ceci, Halpern, Loehlin, Perloff, Sternberg, & Urbina, 2001), which posit a capacity that is fluid and malleable. Secondly, it has been argued that the term is responsible for the controversy and hostility that is apparent in the field, with many psychologists arguing that there can be no “emotional” intelligence in the true sense of the term. However, there is increasing evidence that the traditional attributes of an “intelligence” (e.g., conceptual operationalization, relationship to pre-existing intelligences, and developmental characteristics) can be applied to the emotional domain. 

测量工具

In terms of conceptual operationalization, an increasing number of assessment tools for emotional intelligence are being reported (e.g., Jordan, Ashkanasy, Hartel, & Hooper, 2002; Mayer, Salovey, Caruso, & Sitarenios, 2003; Sparrow & Maddocks, 2003; Wagner, Jester, & Moseley, 2001), though not all are well validated (Davies, Stankov, & Roberts, 1998) or reliable (Davies, Stankov, & Roberts,

1998; Roberts, Zeidner, & Matthews, 2001), and some measures overlap significantly with traditional measures of personality (Ciarrochi, Chan, & Caputi, 2000). However, critical evaluation of tools such as the Multi-Factor Emotional Intelligence Scale (Mayer et al., 2003) has suggested that the emotional intelligence construct is distinctive and useful (Ciarrochi et al., 2000).

In terms of relationship to intellectual or cognitive intelligence, investigations aimed at establishing the divergent validity of emotional intelligence from IQ failed to find a relationship between several of the measures of emotional intelligence and well-validated tests for IQ (Bar-On, 1997; Ciarrochi et al., 2000; Derksen, Kramer, & Katzko, 2002; Mayer, Caruso, & Salovey, 1999; Newsome, Day, & Catano, 2000), but did find a relationship, albeit a small one, with verbal IQ (Hemmati, Mills, & Kroner, 2004; Mayer et al., 1999; Mayer, Caruso, & Salovey, 2000).

Finally, with regard to developmental characteristics, there is evidence that emotional intelligence does increase with age (Bar-On, 1997; Derksen et al., 2002). McPhail (2004) has produced a hierarchical diagram to illustrate how progression through the stages of emotional intelligence might look (Figure 1). The top of the pyramid represents the highest level of emotional intelligence. The various stages can be defined as follows: **情商发展的四个阶段**

1. Emotional awareness, or the awareness of one's own emotions and the ability to identify them correctly. This stage may also include the ability to recognize (in the sense of naming) the emotions of others. **情感觉醒**
2. Emotional application, or the ability to identify which emotions are appropriate in specific situations. **情感应用**
3. Emotional empathy, or the ability to enter into the feelings of others. **移情**
4. Emotionality, or a level of emotional self-awareness used consciously to guide decision-making. This may be thought of in terms of Schumpeter's notion of intuition. **情商**

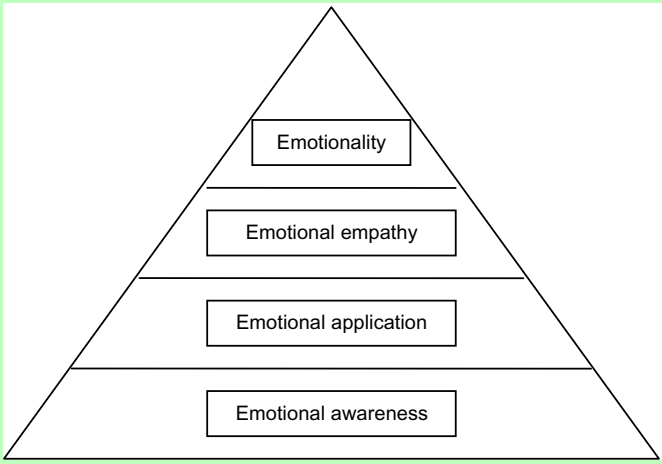



Figure 1. McPhail's (2004) stages of emotional awareness

### *Integrating a Multitude of Definitions*

In attempting to provide a broad typology of the constituents of emotional intelligence (EI), Petrides and Furnham (2001) have established (via content analysis) 15 facets common to the various theoretical models (e.g., Gardner et al., 1995; Goleman, 1995; Mayer, DiPaolo, & Salovey, 1990) in this area (Table 1).

Although it is difficult to pare these facets down into a single definition, it is reasonable to suggest that EI involves **the ability to draw upon key personal** (adaptability, impulsiveness [low], self-esteem, self-motivation, stress management, trait happiness, and trait optimism), **social** (assertiveness, relationship skills, social competence, and trait empathy), and **emotional** (emotional expression, emotional management, emotional perception, and emotional regulation) attributes in order to adapt effectively to a given social context such as the school, workplace, or home. However, it should be noted that this approach to definition is not without its critics. For instance, Zeidner, Roberts, and Matthews (2002) suggest that such an all-encompassing characterization leaves the term “bereft of any conceptual meaning” (p. 215). Furthermore, arguments put forward by Sparrow and Maddocks (2003) question the use of standard psychometric criteria when evaluating the current EI measures, because of the very nature of “emotional intelligence”. They argue that measures based on self-reporting (which are the basis of most of the current instruments) are unable to measure a concept that simultaneously requires a degree of self-awareness to answer accurately and also assesses the component of “self-awareness” itself. They also argue that the usual psychometric criteria of having components which are orthogonal cannot apply to emotional intelligence. According to their definition, the components must be quite highly associated, albeit not measuring the same thing. 

### **How Is Emotional Intelligence Related to, or Different from, Existing Constructs?**

Related to the issue of definition of EI is the extent to which it can be placed clearly within the context of existing related constructs, such as personality variables and general cognitive ability (although this issue was alluded to in the previous section, we feel it warrants further discussion). Perhaps unsurprisingly, given the aforementioned problems of definition and the multifaceted influences on the development of

Table 1. Facets of emotional intelligence (adapted from Petrides & Furnham, 2001)

Type of attribute	Facets
Personal	Adaptability, impulsiveness (low), self-esteem, self-motivation, stress management, trait happiness, trait optimism
Social	Assertiveness, relationship skills, social competence, trait empathy
Emotional	Emotional expression, emotional management, emotional perception, emotional regulation

the construct, there are no clear answers in this area. Several studies have found strong relationships between emotional intelligence and variables such as extraversion and openness to experience (Gannon & Ranzijn, 2005; Schulte, Ree, & Carretta, 2004; Van Rooy, Viswesvaran, & Pluta, 2005), calling into question the “distinctiveness” of the construct. However, other studies (e.g., Law, Wong, & Song, 2004) have yielded opposing results. It seems that much of the equivocal state of research findings stems from the way in which EI is measured (an issue addressed in the next section). For instance, Warwick and Nettleback (2004) found that EI correlated with certain personality variables when measured by the Trait Meta-Mood Scale (TMMS), but not when measured by the Mayer-Salovey-Caruso, Emotional Intelligence Test (MSCEIT).


The research literature on the relationship between emotional and general intelligence presents a slightly simpler (if not altogether clear-cut) picture. Several studies (e.g., Derksen et al., 2002; Fox & Spector, 2000; Lam & Kirby, 2002) appear to demonstrate that emotional intelligence is distinct from general intelligence. However, this conclusion has not been reached in all empirical enquiries in this area. The aforementioned Schulte et al. (2004) study, for instance, found a significant relationship between emotional intelligence (measured by the MSCEIT) and general cognitive ability (measured by the Wonderlic Personnel Test or WPT), leading these researchers to “question the uniqueness of EI as a construct and conclude that its potential for advancing our understanding of human performance may be limited” (p. 1059). Research such as this raises an important issue as to what the appropriate threshold for “distinctness” of psychometric constructs should be (although statistically significant, the correlation between EI and general cognitive ability in this study was only moderate, at  $-.454$ , indicating that general cognitive ability accounted for only 20% of the variance in EI scores).

### How Do We Measure Emotional Intelligence?


Allied to definition is the method of assessment of a construct, and for emotional intelligence this has also proven controversial. Methods of assessing EI can be broadly trichotomized into self-report, ability, and informant measures (of which the latter is the least commonly used and will not be discussed here) (Mayer, Caruso, & Salovey, 2000). These different approaches can be seen as reflecting different conceptual understandings of emotional intelligence. For instance, those who understand EI as a well-defined set of emotion-processing skills reflect this in their use of ability-based measures, whereas those who adopt a broader, protean conceptualization tend towards the use of self-reports (Zeidner et al., 2002). Neither family of thought has yet provided a completely satisfactory method of assessment.

Self-report measures of emotional intelligence (such as the BarOn EQ-i measure; Bar-On, 1997), whilst more abundant and frequently used, have also been subject to the largest amount of criticism. At a basic level they are, of course, subject to the standard limitations that plague all self-report inventories, such as deception, social desirability, and image management (Zeidner et al., 2002). What is particularly



troublesome, though, is the use of self-reports as a valid way to measure a construct that has purported to be a traditional form of intelligence. Research examining the relationship between self-reported and ability measures of general intelligence yields correlations as low as .30 (9% of variance in one variable accounted for by the other), indicating that people are generally extremely poor at providing accurate estimates of their actual intelligence levels (Mayer, Caruso, & Salovey, 2000; Zeidner et al., 2002). In the specific case of emotional intelligence, such estimates may be even worse; Brackett and Mayer (2003) found a correlation of only .21 (4% of variance in one variable accounted for by the other) between self-reports of emotional intelligence (as measured by the aforementioned EQ-i) and an ability-based measure (the MSCEIT). 

Although subject to less criticism than self-report measures of emotional intelligence, ability-based measures are also not without their problems. An initial problem arises when one begins to examine exactly what constitutes a correct answer in such tests. In traditional IQ tests, a rationale generally exists for justifying the correctness of an answer, often derived from a formal, rule-bound system (e.g., logic) (Zeidner et al., 2002). No such system exists that one can relate to, for instance, recognition of emotions in others, meaning that researchers have had to rely on potentially inaccurate scoring procedures, such as expert or consensual scoring. A second problem arises in trying to conceive of an ability-based measure of recognition of one's own emotions (a fundamental aspect of all the major theoretical models of EI), since this inevitably involves a strong degree of introspection, leading us back to self-report. As yet, there is no satisfactory answer to this conundrum (Mayer, Caruso, & Salovey, 2000).

The controversy surrounding the measurement of emotional intelligence has led some researchers to adopt interesting theoretical perspectives on the matter. Perez, Petrides, and Furnham (2005), for instance, contend that self-report and ability-based measures are measuring conceptually distinct entities: trait EI (or “emotional self-efficacy”) and ability EI (or “cognitive–emotional ability”), respectively. Although this goes some way to explaining the low reported correlations between the two methods of assessment, it does little to demystify an already complex and confusing field of study. 

### How Would Improved Emotional Intelligence Affect Real-World Behavioural Expressions? 情商对现实世界的实际效应

The purported effects of improved emotional intelligence on real-world behavioural expressions relate to (a) improved academic achievement, (b) prevention and health, well-being, and adjustment, and (c) career or workplace performance. The first of these, improved academic performance, is perhaps the most contentious. Goleman (1995) has suggested that EI can predict success at school as well as or **better than IQ**. Various other proponents of EI (e.g., Zins, Weissberg, Wang, & Walberg, 2004) have made similar claims. However, these claims are, at present, based on a somewhat limited (both in terms of number and methodological and analytical rigour of

studies) and contradictory evidence base. For instance, Schutte et al. (1998) found that EI measures taken at the start of an academic year successfully predicted grade-point averages at the end of the year. However, this study involved a relatively small sample of undergraduate participants ( $N = 63$ ), and only yielded a correlation of .32. Although statistically significant, this finding suggests that EI only accounts for around 10% of the variance in academic success. In a study referred to by Bar-On (1997), Swart (1996) compared academically successful and unsuccessful students (defined by 1st-year grades) and found significant differences on total scores for the EQ-i scale of emotional intelligence. However, no indication of effect size was given by the author, and it is therefore impossible to determine the size of the difference between these two groups. Adding to the uncertainty, a study by Greenberg and Kusche (2003) found no differences in reading or mathematical achievement between a group of elementary-school students who had been taught using the Promoting Alternative THinking Skills (PATHS) curriculum, the aim of which is to promote social and emotional learning, and a comparison group.

Research involving design and analysis procedures that are more appropriate, given the nature of the purported link between EI and academic performance (e.g., regression analysis and structural equation modelling), has also yielded inconsistent results. Petrides, Frederickson, and Furnham (2004) found, using a structural equation modelling approach, that EI moderated the relationship between cognitive ability and performance. In a similar vein, Gumora and Arsenio (2002) found that aspects of EI (e.g., emotional regulation) significantly contributed to grade-point averages of middle-school students, over and above the contribution made by cognition-related abilities. In contrast, Barchard (2003) found that measures of EI were unable to add significantly to the incremental predictive validity for academic performance over and above the contribution made by cognitive and personality variables. The disparity in research findings could have theoretical and/or methodological roots, but what is abundantly clear is the need for further, rigorous empirical inquiry in this area if the exact nature of the relationship between EI and academic achievement is to be drawn out.

The research evidence relating to the impact of improved EI on prevention and health, well-being, and adjustment is more straightforward. “Prevention” in this context typically refers to reducing risks of substance abuse, mental health problems, and delinquency (Kam, Greenberg, & Walls, 2003). “Health, well-being, and adjustment” is therefore intertwined with the prevention process; in reducing the risk of maladaptive behaviours, educators simultaneously provide opportunities for adaptive personal growth. The rationale for the purported role of EI in this context is outlined eloquently by Elias and Weissberg (2000): “If children are not aware of their feelings, they will find it difficult to make reasoned decisions, control impulsive actions, or say what they really mean” (p. 186). Examples of the useful preventative qualities of improved EI abound. For example, Kam et al. (2003) report on a controlled trial that highlighted the success of the PATHS curriculum in reducing problem behaviours and depressive symptoms in children with special educational needs, even at 2-year follow-up. Furthermore, Kusche (2002) reported


on three controlled trials that further support this pattern of findings. Likewise, Petrides et al. (2004) found EI measures to be negatively associated with truancy and exclusions in a sample of 650 secondary-school children. However, it is important to note that, in the latter study, the authors failed to explore potential confounds, such as the role of parents, in their analysis. Thus, although children with low EI may engage in high rates of truancy, it is perfectly reasonable to suggest that both factors are likely to be directly influenced by the child-rearing practices that parents of such children engage in. This notion is lent support by Elias and Weissberg (2000), who consider parents to be of paramount importance in developing children's social and emotional competencies. Furthermore, research conducted by Allan Schore on emotional regulation in children demonstrates that the degree of attunement between a mother and an infant at 10 months will predict the ability of the child to manage intense emotions (such as frustration and fury) at 2 years (Schore, 1999). He postulates that the nature and quality of carer-child interactions actually shapes and determines the brain's formation and is the physiological parallel of the emotional attachment between the two. In adults, recent research has shown that individuals with higher levels of emotional intelligence suffer less subjective stress, experience better health and general well-being, demonstrate better management performance, and are less likely to experience burn-out in very highly stressed jobs such as nursing (Gerits, Derksen, Verbruggen, & Katzko, 2005). Finally, Brackett, Mayer, and Warner (2004) provide evidence from college students suggesting that the inability to perceive emotions and to use emotion to facilitate thought is associated with such negative outcomes as illegal drug use and deviant behaviour.

With regard to career or workplace performance, there are a variety of logical reasons to assume that improved EI would be beneficial. Emotionally intelligent individuals presumably succeed in communicating their ideas goals and intentions in the workplace, have the social skills needed for teamwork, and, in the case of leaders, can provide a more supportive organizational climate (Zeidner, Matthews, & Roberts, 2004). At first glance, the research appears to support these ideas. For example, Srivastava and Bharamanaikar (2004) found that EI measures correlated significantly with transformational leadership and success in a sample of 291 Indian army officers, leading the authors to suggest that EI should be used to identify and develop effective leaders. Also, Rapisarda (2002) found EI competencies to be positively related to ratings of team cohesiveness and performance in students on an executive MBA programme. Other research, such as Higgs' (2004) study of the relationship between EI and performance in call centres in the United Kingdom, follow similar trends.

However, these and other results in this area need to be treated with caution. First, much of what is reported is correlational in nature; this is in contrast to the "causal" prose adopted by many authors (for instance, Rapisarda [2002] talks of the "impact" of EI on performance). As Zeidner et al. (2004) observed in their review, "empirical evidence supporting the *direct* [our emphasis] role of EI in the workplace... is meagre" (p. 388). Secondly, some studies, such as that reported by

Feyerherm and Rice (2002), have yielded findings that directly contradict the apparent trend in this area (e.g., the aforementioned authors found no relationship between EI components and measures of productivity or continuous improvement performance). Thirdly, there are valid theoretical objections to the purported importance of EI in the workplace. For example, with regard to leadership effectiveness, Antonakis (2003) points out that elevated levels of emotional recognition might not be useful, because individuals could easily gauge and then magnify or misinterpret emotions in others. Conversely, being immune to emotional nuances might be adaptive for leaders, because “they would be able to focus on the mission and would not be derailed by negative emotions, pandering to individuals, and being agreeable” (Antonakis, 2003, p. 357).

### **Can Emotional Intelligence Be Taught?**


Answering the question of whether emotional intelligence can be taught requires several key issues to be examined. First, one must establish a credible rationale for the processes that might occur in the “learning” of emotional intelligence. Secondly, the empirical evidence relating to the efficacy of attempts to teach EI needs consideration. Finally, given that most of the literature in this area is drawn from work in schools, by their nature complex and idiosyncratic environments, factors relating to successful implementation of EI programmes should also be explored. 

Establishing a credible rationale for the process of emotional learning can be achieved by reference to neuroanatomical function. In this framework, emotional intelligence represents the ability of the higher brain centres to monitor and direct more primitive emotional signals from phylogenetically older brain structures, such as the amygdala, in such a way that they are used constructively by the individual rather than destructively. The amygdala has been described as being the progenitor of those things that are entirely self-serving and self-seeking (e.g., obsessive compulsive behaviours, deception, superstitious acts) (McLean, 1970).

This primitive structure is, however, subject to “top-down” control and alteration from the higher (and more phylogenetically recent) cortical structures, specifically the anterior frontal lobes (Hariri, Bookheimer, & Mazziotta, 2000; Rolls, 2004; Rosenkranz, Moore, & Grace, 2003). It is likely that individuals with high levels of emotional intelligence are able to perceive their emotional states using higher cortical centres as an “observer” of internal state (MacLean, 1977), and then direct and control these states to better suit the external environment. Educating an individual so that they have greater emotional intelligence therefore becomes the learning by higher brain centres of new or different patterns of behaviour, and the acceptance in a “top-down” way by deeper cerebral structures of this new direction (Rolls, 2004). As learning is dependent on dopamine, and as dopamine release is predominantly controlled by the limbic system (see above), the central goal of social and emotional learning must therefore be to change the individual’s perception of reward from one of self-serving and self-seeking gratification (i.e.,

those things that feed our phylogenetically older cerebral structures) to one where reward is gained through understanding the emotional needs of other people as well as their own. Although these purported sets of processes may seem somewhat reductionist in nature, they do succeed in providing a logical, credible account of emotional learning. **以上两段都是以神经学为理论基础**

Turning to empirical evidence relating to the teaching of EI, even a cursory examination shows that the turmoil and contention observed in other areas of the literature is also apparent here. A variety of school-based intervention programmes (such as the aforementioned PATHS curriculum) have been developed and subjected to empirical evaluation (see Zeidner et al., 2002, for a review), most of which have yielded positive results. However, key limitations of such evaluations seriously limit the extent to which firm conclusions about the “teachability” of EI can be drawn. For example, many of the programmes (and subsequent evaluations) cited by EI lobbyists were not specifically designed to address EI, and thus their EI “content” is often meagre (Zeidner et al., 2002). This begs the question of what is in fact taught in such programmes, and the relationship of this to EI outcome measures. With regard to the former, this ranges greatly from programme to programme, but typically includes content tangentially related to EI, such as problem-solving skills (Clabby & Elias, 1999) and general good citizenship (Developmental Studies Centre, 1999). Concerning the latter, exploring any relationship becomes difficult once it becomes apparent that the validity of the outcome measures of such studies is often questionable. Very few have actually used EI measures, with the majority preferring to examine outcomes thought to be influenced by improved EI (such as reductions in aggressive behaviour). Thus, improvements in EI can only be inferred. **情商测量的依附性**

Of those intervention programmes that were designed specifically to promote EI and also to include EI outcome measures in their supporting research base, the most widely known and rigorously researched is the **PATHS curriculum** (Greenberg, Kusche, & Riggs, 2004). In a typical study, which utilized a randomized control design and involved 4 schools and nearly 300 children, Greenberg, Kusche, Cook, and Quamma (1995) found that implementation of the PATHS curriculum led to significant improvements in vocabulary and fluency in discussing emotional experiences, management of emotions, and emotional understanding (assessed using the Kusche Affective Interview). Although this study clearly supports the notion that EI can be taught, a couple of cautionary notes must be made. First,  randomization process for this study took place at school level (that is, 2 schools were randomly assigned to the intervention condition, and 2 to the control condition). Although the reasons for this are sound (PATHS is built on a whole-school approach to emotional learning, and treatment diffusion effects would have been a strong possibility if randomization had occurred within schools), it should be noted that this design carries with it an implicit assumption that the schools are somehow “matched” or “equivalent”, and therefore opportune sources for comparison. However, the heterogeneity of ethos and practices one observes visiting any number of schools renders this assumption simplistic at best. A second note of caution should be made

with regard to the outcome measure (the Kusche Affective Interview-Revised) used, for which there is little in the way of published psychometric information to date.

A further note of caution also involves the interplay between the social and emotional ethos of a school and a specific taught curriculum. Although obviously the diffusion effects of programmes taking place within different schools with different cultures must be considered, so must the research that points towards the probability that the teaching of social and emotional education must take place within a warm, positive, and supportive environment for it to be effective and sustainable. Given the research on the impact of modelling and attachment issues (Schoore, 1999), it is clear that there is a considerable “caught” aspect to emotional education (Weare & Gray, 2003). A “taught” aspect is now also critical, since family interaction patterns are so different from in the past that children can no longer rely on receiving the necessary input through everyday communication. Research on what actually works best, conducted by Weare and Gray (2003), demonstrated that an environment where the social and emotional aspects of learning were both “taught” and “caught” gave the most consistent results. Thus, any programme’s assessment must also consider whether it is being evaluated for its long-term impact and sustainability, rather than quickly evident changes.

This view is supported by the work of Elias, Zins, Gaczyk, and Weissberg (2003), who stress the need for whole-school adoption of an EI ethos alongside the implementation of any intervention programme. This notion is highlighted most eloquently in a study by Kelly, Longbottom, Potts, and Williamson (2004), who report a class teacher as saying, “It should... fit with the school ethos or it risks not being understood or appreciated” (p. 231). Furthermore, it would be naïve to conceptualize an EI programme as an “add-on” to the existing curriculum; in order for such ventures to be successful, they should be fully integrated into the overall school academic programme (Zins et al., 2004). As Zeidner et al. (2004) note, without this overall commitment “emotional education” can often be received sceptically by educators, who may see it as beyond the primary remit of schools. Without irrefutable evidence that EI is either intrinsic to academic achievement or an important outcome in itself (or, indeed, both), this level of scepticism may be difficult to circumvent.

## Conclusion

The concept of emotional intelligence has captured the imagination of academia and the popular media alike. With specific reference to education, it has been claimed that facilitation of EI can improve children’s academic achievement (Zins et al., 2004), promote their well-being and adjustment (Weissberg, 2000), and reduce risks of substance abuse, mental health problems and delinquency (Kam, Greenberg, & Walls, 2003). However, our review of the literature suggests that such claims may be premature. The first warning sign is that the concept itself has consistently defied a clear and agreed-on definition—a basic scientific requirement. Furthermore, it is still unclear whether emotional intelligence represents anything more than a combination of personality variables and certain aspects of general cognitive ability (Schulte

et al., 2004). Allied to this, there seems to be little agreement as to how the construct should be assessed.

With regard to the claimed benefits of facilitating emotional intelligence, it is hoped that this review of the literature serves as a reminder that education has tended to be attracted to overly simplistic solutions to complex problems. Given the current evidence base, one cannot escape the conclusion reached by Barchard (2003) that “EI is not the panacea that some writers claim” (p. 856). There are a number of problems with the methodologies used in the research that is used to support the claimed benefits. In particular, there are few high-quality controlled longitudinal studies that have evaluated the long-term impact of introducing EI into schools, and the majority of previous studies have only focused on primary-school pupils. In order to explore the impact of introducing EI to schools in more depth, it is important for studies that address these concerns to be carried out in the near future. Without more convincing evidence emerging from high-quality studies, doubts will remain about the potential benefits of this most elusive form of intelligence.

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