

Can emotional and social abilities predict differences in progress at secondary school?

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Cambridge Assessment undertook this large-scale questionnaire survey of British students aged 16 to determine whether relationships exist between candidates' levels of emotional intelligence and progress in different GCSE subjects. Responses to a Trait Emotional Intelligence Questionnaire from almost 2000 science candidates from 31 schools were analysed. The questionnaires were completed prior to the June 2007 examination session and questionnaire scores were later matched to participants' Key Stage 3 results and GCSE grades. The first phase of the research investigated the relationship between trait EI and performance in six different science specifications. A second phase of the study looked at the relationship in a wider range of GCSE subjects taken by the students in the sample. In particular, it addressed subjects such as English, Drama and Art and Design which might be expected to be more affected by EI.

Previous research on emotional intelligence and achievement

- Goleman (1996) popularised the term 'Emotional Intelligence' and argued that emotional and social abilities can be more influential than conventional intelligence for all kinds of personal, career and school success.
- Studies in the 1990s examined whether emotional intelligence was related to academic performance (e.g. Abusserie, 1995; Swart, 1996; Bar-On, 1997; Pasi, 1997; Schutte et al., 1998) but none of these controlled for prior attainment or cognitive ability.
- More recently, research has suggested that motivation, along with ability and other personality traits, is important in predicting academic school performance, in some cases over and above the contribution made by a measure of prior attainment (e.g. Gumora and Arsenio, 2002; Lam and Kirby 2002; Catalano et al., 2004; Humphrey et al., 2007).
- In terms of trait EI, this has been found to moderate the relationship between cognitive ability and achievement in adolescent children, particularly in those with lower cognitive ability (e.g. Petrides, Frederickson & Furnham, 2004; Quater et al., 2007).

Statistical analyses

Overall GCSE attainment

To investigate the relationship between trait EI and general academic performance, a multilevel model, in which students (level 1) were nested in schools (level 2), was used. Multilevel models recognise the clustering of individuals within school (i.e. individual students are grouped into schools and students in the same school may have more in common with students in other schools). The explanatory variables were gender, Key Stage 3 score (total of the levels obtained in English, Maths and Science) and each of the trait EI subscales/factors. The outcome measure was overall GCSE attainment, measured by the mean GCSE score. The multilevel model can be expressed as:

$$\bar{y}_j = \beta_0 + \beta_1 \text{gender}_j + \beta_2 \text{EI measure}_j + \beta_3 \text{KS3}_j$$

where \bar{y}_j is the predicted mean GCSE score for the i th student in the j th school.

Individual GCSE subjects

In order to investigate if trait EI would account for better performance in a specific subject at GCSE, proportional odds regression was used. Specifically, the grade obtained in a particular subject was modelled in a regression analysis where gender, school, Key Stage 3 score (total of the levels obtained in English, Maths and Science) and each of the trait EI subscales/factors were the independent variables. The proportional odds regression can be expressed as

$$\log \left(\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right) = B_{0,j} + \beta_1 \text{gender} + \beta_2 \text{school} + \beta_3 \text{EI measure} + \beta_4 \text{KS3}$$

where $P(Y \leq j)$ is the probability of obtaining at least grade j or above compared to obtaining a lower grade ($= A^*, A, B, C, \dots, F$)

For each subject and for each trait EI subscale/factor, a proportional odds regression model was fitted.

What is trait EI?

Trait emotional intelligence (trait EI) covers a wide range of skills and personality dispositions, such as motivation, confidence, optimism, adaptability and coping with stress. Many primary and secondary schools in England are currently involved in a government initiative to develop the emotional, social and behavioural skills of their pupils, through programmes such as 'Social and Emotional Aspects of Learning' (SEAL), with the intention of improving academic attainment as well as behaviour.

Trait EI is defined for the purpose of the research as: "A constellation of behavioural dispositions and self-perceptions concerning one's ability to recognise, process and utilise emotion-laden information." (Petrides & Furnham, 2000)

Trait EI was measured using the Trait Emotional Intelligence Questionnaire (Petrides, 2001) which measures people's perceptions of their own abilities by rating their agreement with 153 statements. Analysis of the questionnaire responses generates a global emotional intelligence score, as well as scores for 15 subscales which are detailed in the table below. The subscales are organised into four factors of wellbeing, self-control, emotionality and sociability.

Factor	Subscale	High scorers perceive themselves as...
Wellbeing	Self-esteem	...successful and self-confident.
	Happiness	...cheerful and satisfied with their lives.
	Optimism	...confident and likely to "look on the bright side" of life.
Self-control	Emotion regulation	...capable of controlling their emotions.
	Impulsiveness (low)	...reflective and less likely to give in to their urges.
	Stress management	...capable of withstanding pressure and regulating stress.
Emotionality	Emotion perception	...clear about their own and other people's feelings.
	Emotion expression	...capable of communicating their feelings to others.
	Relationships	...capable of having fulfilling personal relationships.
Sociability	Empathy	...capable of taking someone else's perspective.
	Assertiveness	...forthright, frank, and willing to stand up for their rights.
	Emotion management	...capable of influencing other people's feelings.
Sociability	Social awareness	...accomplished networkers with excellent social skills.
	Self-motivation	...driven and unlikely to give up in the face of adversity.
	Adaptability	...flexible and willing to adapt to new conditions.

Results – Overall GCSE

Mean GCSE analysis: regression parameters for each trait EI subscale/factor (significant effects are highlighted in bold type)

El subscales/factors	Estimate	Std Err
Self-esteem	0.10	0.03
Emotion expression	-0.01	0.03
Self-motivation	0.21	0.03
Emotion regulation	0.11	0.03
Happiness	0.07	0.02
Empathy	0.11	0.03
Social awareness	0.03	0.03
Impulsivity (low)	0.22	0.03
Emotion perception	0.12	0.03
Stress management	0.09	0.03
Emotion management	-0.02	0.03
Optimism	0.07	0.03
Relationships	0.09	0.03
Adaptability	0.05	0.03
Assertiveness	0.03	0.03
Wellbeing	0.10	0.03
Self-control	0.22	0.04
Emotionality	0.11	0.04
Sociability	0.02	0.04
Trait EI	0.22	0.05

Results – Individual GCSE subjects

Emotional Intelligence subscales and factors significantly affecting, positively (+) or negatively (-), students' progress from Key Stage 3 to GCSE

El Subscales and Factors	English	English Literature	Maths	Art and Design	Drama	French
Self-esteem	+	+				+
Emotion expression						
Self-motivation	+	+	+	+	+	+
Emotion regulation						
Happiness	+	+				
Empathy	+	+				
Social awareness	+	+				-
Impulsivity (low)	+	+	+	+	+	+
Emotion perception	+	+				
Stress management	+					
Emotion management	+					
Optimism	+					
Relationships						
Adaptability					+	
Assertiveness	+					
Wellbeing	+	+				
Self-control	+	+	+	+		
Emotionality	+	+	+	+		
Sociability	+	+	-	-	-	-
Trait EI	+	+	+	+		

Emotional Intelligence subscales and factors significantly affecting, positively (+), students' progress from Key Stage 3 to GCSE in science subjects

El Subscales and Factors	Applied Science	Biology	Chemistry	Physics	21st Century Science
Self-esteem	+	+	+	+	
Emotion expression					
Self-motivation	+	+	+	+	+
Emotion regulation	+	+	+	+	
Happiness	+	+	+	+	
Empathy	+	+	+	+	
Social awareness	+	+	+	+	
Impulsivity (low)	+	+	+	+	+
Emotion perception	+				
Stress management	+				
Emotion management	+				
Optimism	+				
Relationships	+	+	+	+	
Adaptability	+	+	+	+	
Assertiveness	+				
Wellbeing	+	+	+	+	
Self-control	+	+	+	+	+
Emotionality	+				
Sociability	+				
Trait EI	+	+	+	+	

The effect of EI, after accounting for prior attainment

This figure shows the probability of achieving a grade C or above in applied science as a function of both Key Stage 3 scores and total trait EI scores. The axes cover the ranges of scores that were actually achieved by the sample.

The different colours represent different probabilities of achieving the grade, with green colours for low probabilities and red colours for high probabilities. Thus increasing either KS3 score or trait EI score leads to an increased probability.

To take an example, the dotted horizontal line on the graph is for pupils with a Key Stage 3 total score of 16 (about average in this sample). If a pupil on this line had an EI score of 3 their probability of achieving a grade C or above would be in the green-yellow zone (around 0.4). Increasing the EI score to 4 without changing the KS3 score (as in direction of arrow) would give a probability in the orange zone (over 0.6). Thus even a one point increase in EI from 3 to 4 increases the probability from 0.4 to over 0.6. This demonstrates the impact that EI has on top of prior achievement.

Key findings

- Almost all EI subscales and factors (except emotion expression, social awareness, emotion management, adaptability and assertiveness) were predictors of mean GCSE attainment, after controlling for KS3 performance.
- The self-motivation and low impulsivity subscales of trait EI were significant predictors of attainment in almost all of the sciences investigated. The degree to which other emotional intelligence subscales predicted attainment in science varied by specification.
- The emotion expression, emotion management and assertiveness subscales were not significant predictors of progress in any science GCSE.
- The self-motivation and low impulsivity subscales were also significant predictors in almost all of the non-science GCSE subjects investigated: English, English Literature, Art and Design, Drama and Mathematics. The exception was GCSE French, where only low impulsivity predicted progress.
- However, for GCSE Mathematics, students who scored highly on the emotion expression, social awareness and emotion management subscales were likely to achieve less than would be expected given their KS3 attainment.
- Trait EI may have a larger effect where prior attainment is lower.

Implications

The main results suggest that academic ability is not the only predictor of educational achievement and that emotional intelligence has a very important effect on learning. This is supported by research from the United States (Catalano et al., 2004) and Australia (Bernard, 2006) which has shown that interventions to improve the emotional and social skills of adolescents do result in improved educational outcomes, suggesting that the relationship is a causal one. Therefore, attempts to improve the emotional and social skills of British schoolchildren may well be worthwhile and may also be more effective than concentrating solely on curriculum initiatives.

The findings of this research complement previous Cambridge Assessment research studies which have found that factors such as ability are not the only predictors of attainment. It is the combination of ability, individual characteristics, home background, type of school attended and social, behavioural and emotional aspects that is important.

