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Abstract This paper explores approaches to the development of Emotional Intelligence (EI) and to the critical question ‘can EI be developed?’ Technical data on the instruments used to measure EI, the Emotional Intelligence Questionnaire (EIQ) devised by Dulewicz and Higgs (2000c) and the EQ-i designed by Bar-On (1997), are reported. Findings from three studies involving managers, team leaders and the skippers and crews from a round-the-world yacht race are presented to explore whether Emotional Intelligence scores change after training and other experiences. A revised model to explain how the elements of Emotional Intelligence are related to each other is presented and tested, and possible explanations of why some elements are more amenable to development actions are proposed.

Keywords Emotional Intelligence; developing EI; EI training; EI model.

Introduction

From a review of a wide range of the literature in the field of Emotional Intelligence (Gardner, 1983; Gardner and Hatch, 1989; Salovey and Meyer, 1990; Goleman, 1996, 1997; Steiner, 1997; Cooper and Sawaf, 1997) conducted by Dulewicz and Higgs (2000a), it is evident that this is an important topic for occupational psychology. Indeed, Emotional Intelligence (EI) is also a very hot topic in human resource management, judging by the extensive media coverage given to the subject over the last few years, and the great interest shown in the topic by people from all walks of life. It is argued that it has tremendous potential value not only for managers and HR professionals but also for teachers, educationalists and counsellors (e.g. Higgs and Dulewicz, 1999). However, it is a concept that is surrounded by controversy. In the UK recently, Woodruffe (2001) challenged the growth in the popularity of the concept on the basis that it was both unproven and, indeed, nothing new although this point was firmly rebutted by researchers working in the area (e.g. Goleman, 2001; Dulewicz and Higgs, 2001a).

There appears from the literature to be some debate about what constitutes the domain of Emotional Intelligence, about terminology used to describe the construct and about methods used to measure it. Furthermore, there is a debate around the theoretical framing of the construct. Mayer *et al.* (1999) view the construct as an ability and designed a questionnaire to measure it in this way. ‘Our focus is on ability measures of EI because we view these instruments as the most promising’ (Mayer *et al.*, 2000). Goleman (1998) adopted a very different view of the construct, seeing it as being competencies-based.

Professor Victor Dulewicz, PhD, Head of HRM and Organizational Behaviour Faculty, Professor Malcolm Higgs, DBA, Academic Dean, Henley Management College, Greenlands, Henley-on-Thames, Oxfordshire, RG9 3AU, UK (tel: +44 (0)1491 571454; fax: 44 (0)1491 571635; e-mails: vic.dulewicz@henleymc.ac.uk; malcolm.higgs@henleymc.ac.uk).

He presented a model with twenty-five competencies, derived from the Hay-McBer competencies framework, arrayed in twelve clusters, and these have since been reduced empirically to twenty competencies to form the Emotional Competencies Inventory (Boyatzis *et al.*, 2000). Other authors (e.g. Bar-On, 1997; Dulewicz and Higgs, 2000c) have taken a third view and have operationalized the construct through questionnaires and models derived from empirical research into personal factors related to EI, and particularly into 'emotionally and socially competent behaviour' (Bar-On, 2000: 364). Henceforth, we will call this the EI personal factors model.

Within the larger debate, a key question often posed is 'can an individual's Emotional Intelligence be developed or is it an inherited or enduring trait?' Within much of the literature relating to Emotional Intelligence, there is a strong consensus that it is a developable trait or competency (e.g. Goleman, 1996; Steiner, 1997; Höpfl and Linstead, 1997; Cooper, 1997; Martinez, 1997). However, the ability-based view (Mayer *et al.*, 2000) does not form part of this consensus. Much of the popular literature is devoted to describing processes or programmes designed to help individuals develop their Emotional Intelligence (e.g. Martinez, 1997; Farnham, 1996; Harrison, 1997; Cooper, 1997). Within this literature, issues do arise in relation to the stage in an individual's life at which interventions designed to build effective Emotional Intelligence are most effective. Goleman (1996) comments that, while Emotional Intelligence is amenable to development, it is interventions during childhood that are most effective. Indeed the core linkage with educational research provides the most robust evidence to support such a proposition (Goleman, 1996; Salovey and Mayer, 1990). While building from this research and extensive case study examples, the value of learning intervention during childhood is promoted, some doubts are raised as to the efficacy of learning interventions at later stages in life (e.g. Goleman, 1996).

The significance of the potential value of Emotional Intelligence within an organizational context has led to a range of discussions about its role and developability within a managerial learning context (Fineman, 1997; Höpfl and Linstead, 1997). Indeed, Höpfl and Linstead (1997) point out that, in their view, although the core capabilities are developed within childhood, these are malleable and thus capable of being developed and changed; furthermore, workplace experiences have a significant impact on this shaping process. In developing this argument, they contend that what managers learn in an organization includes 'how to feel about what they do and learn' and that the emotional dimension of the work of management is reflected through working experiences and practices.

In this paper we explore two key issues: (1) different approaches to the development of EI and (2) can EI be developed or not? We report findings from three studies which address these questions but, first, we present technical data on the main instruments used to measure Emotional Intelligence, the Emotional Intelligence Questionnaire (EIQ) devised by Dulewicz and Higgs (2000c) and the EQ-i designed by Bar-On (1997).

The EI instruments

The EIQ

In an exploratory study, Dulewicz and Higgs (2000a) investigated the reliability and construct and predictive validity of three competency-based scales (measuring emotional, intellectual and management competencies) using data gathered from a large sample of general managers in a seven-year follow-up. An EI scale based on sixteen relevant competencies showed promising reliability and predictive validity over a seven-year period. Building on this study, a tailored questionnaire (the EIQ-Managerial), based on a comprehensive review of the literature at the time,

was designed to assess an individual's level of Emotional Intelligence on a self-report basis (Dulewicz and Higgs, 1999; 2000c). From an item analysis, seven separate elements of Emotional Intelligence were identified, which are defined briefly below:

- *Self-awareness*: being aware of one's feelings and being able to manage them
- *Emotional resilience*: being able to maintain one's performance when under pressure
- *Motivation*: having the drive and energy to attain challenging long-term goals or targets
- *Inter-personal sensitivity*: showing sensitivity and empathy towards others
- *Influence*: the ability to influence and persuade others to accept your views or proposals
- *Intuitiveness*: the ability to make decisions, using reason and intuition when appropriate
- *Conscientiousness*: being consistent in one's words and actions, and behaving according to prevailing ethical standards.

Full definitions are provided in Higgs and Dulewicz (1999) and Dulewicz and Higgs (2000c).

The EIQ has been shown to have good psychometric properties. Cronbach's alpha reliability co-efficients for each of the elements are acceptable and the alpha for the overall EIQ score derived from the seven elements is 0.77 (Dulewicz and Higgs, 2000c). A comprehensive review of the existing literature from leading authorities in the field (Gardner, 1983; Gardner and Hatch, 1989; Salovey and Meyer, 1990; Goleman, 1996, 1997; Steiner, 1997; Cooper and Sawaf, 1997) is summarized by Dulewicz and Higgs (2000a). This ensured that all the critical elements of Emotional Intelligence were represented so that the questionnaire had good *content validity*. The authors of the EIQ have also demonstrated its *construct validity* in relation to the 16PF questionnaire; Belbin Team Roles derived from the 16PF; and the Myers Briggs Type Indicator (Dulewicz and Higgs, 1999, 2000c). Dulewicz *et al.* (2001) investigated the degree to which two EI instruments, the EIQ and the EQ-i, measure the same constructs and the relationship between EI and morale and stress at work. Correlations between the two instruments showed *content* and *construct* validity, while correlations with various measures of morale and stress at work produced evidence of *construct* validity.

A study of team leaders in a pharmaceutical company (Dulewicz and Higgs, 2000b, 2000c) provided clear evidence of the *concurrent validity* of the EIQ against measures of current performance. In a study of sales staff (Dulewicz and Higgs, 2000b, 2000c), self-assessments and 360° assessment by the boss were significantly correlated with job performance ratings provided by the boss's boss. Dulewicz *et al.*'s. (2003) study on managers also showed significant relationships between EIQ and current job performance, thus providing further evidence of concurrent validity. Indirect links to the original *predictive validity* study on general managers reported above was provided in the development study of EIQ (Dulewicz and Higgs, 1999). In the team leaders' study noted above, Dulewicz and Higgs (2000b) cross-validated the EIQ against the EI competencies.

The EQ-i

The structure of the EQ-i is based on the literature and its author's research experience as a clinical psychologist. It has good *reliability* and *content* and *construct validity* (Bar-On, 1997). The concept was theoretically developed from logically

clustering variables and identifying underlying key factors purported to determine effective and successful functioning as well as positive emotional health. The EQ-i produces a total EQ score, five composite scale scores and fifteen sub-scale scores, defined by Bar-On (1997), titles of which are presented in Table 8 below. A number of factor analyses were performed and provided empirical support for the 1-5-15 structure of the EQ-i. Therefore, the EQ-i presents a hierarchical structure of Emotional Intelligence (Bar-On, 1997).

The original EIQ model

A concern of some authors in the field has been the disparate nature of the different elements of EI (e.g. Higgs and Dulewicz, 1999). There is much evidence, above, to suggest that each of the elements contributes to managerial performance. But how do they relate to each other, so that the whole is greater than the sum of the parts? The relevant literature, covering competency and personality theory, and Freud's work (Freud, 1920), with his model of the id, the ego and the super-ego, was reviewed. In particular, the conflict between the ego (our consciousness) and the super-ego (our conscience) and the need for balance in order to achieve maturity seemed relevant. An initial model devised by Higgs and Dulewicz (1999) has three main components:

- *The drivers* are motivation and intuitiveness. These traits energize people and drive them towards achieving their goals, which are usually set very high.
- *The constrainers*, high conscientiousness and emotional resilience, on the other hand, act as controls, and curb the excesses of the drivers, especially if they are very high and undirected, or misdirected.
- *The enablers*, self-awareness, interpersonal sensitivity and influence, are those traits that facilitate performance and help the individual to achieve targets or succeed in life generally.

High performance should result, first, if the individual has high scores on all seven elements, and they are all contributing when in balance, or, second, if all scores are average or above, and there are no large disparities between drivers and constrainers. On the other hand, low performance should result, first, if scores are below average on all seven elements *or*, second, if overall EI and the enablers scores are average, but the drivers are high and the constrainers are low, or vice versa. In these cases, there would be imbalance.

A revised model of Emotional Intelligence

Bar-On's (1997) distinction between inter- and intra-personal elements/components is an important one, especially for research into managerial performance because inter-personal elements are paramount if managers are to achieve results with or through colleagues. The authors propose that this distinction should be superimposed on the original EI model (Higgs and Dulewicz, 1999), feedback on which had raised questions about the position of intuitiveness and emotional resilience. A good case has been made for the fact that these elements are more likely to be enablers than either a driver or a constrainer, respectively (Higgs and Dulewicz, 1999). Intuitiveness could be seen as an enabler because its application can facilitate performance when the circumstances necessitate. For example, when someone is under pressure to act or take decisions, and there is not sufficient time to conduct a rigorous analysis of the situation and gather

information, Intuitiveness can become an important quality for taking appropriate action. Emotional resilience was originally considered to be a constrainer because aspects of the elements included the ability to control one's emotions when under pressure. However, the effects of high resilience would be to facilitate or enable high performance while a low score would impede it. Thus, a revision to the Higgs and Dulewicz (1999) model incorporating these two amendments, and superimposing the distinction between inter- and intra-personal elements, would appear like this:

<i>Model components</i>	<i>EI elements</i>
Driver:	Motivation
Constrainer:	Conscientiousness
Intra-personal enablers:	Self-awareness
	Emotional resilience
	Intuitiveness
Inter-personal enablers:	Interpersonal sensitivity
	Influence

A schematic representation of this revised model appears in Figure 1. This clearly differentiates between inter- and intra-personal elements and also reflects the importance of the inter-personal enablers to the link with performance, the other five elements being channelled through these two.

This revised model also reflects the importance of the intellectual competencies (IQ for short) and the managerial competencies (MQ). From previous work, Dulewicz and Higgs (2000a) showed that the IQ competencies cover four broad categories – analysis and judgement; planning and organizing; perspective and risk

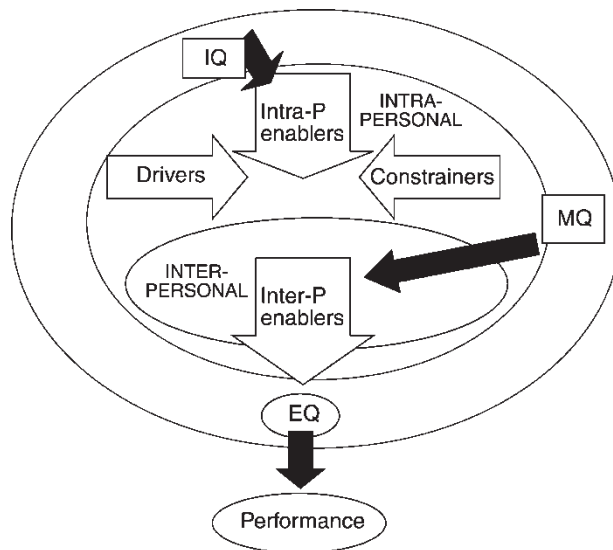


Figure 1 A revised model of Emotional Intelligence, including 'IQ' and 'MQ' competencies

taking and creativity – which all appear to constitute intra-personal qualities. In contrast, the MQ competencies – supervising others; communicating and achieving results – are all clearly inter-personal qualities. The above model reflects these relationships.

Hypotheses

The revised model can be tested using the data from the three studies reported in this paper. Such an analysis could facilitate our understanding of the development of EI. Therefore, in this study, hypotheses reflecting different combinations of driver, constrainer, interpersonal and intra-personal elements of EI, and IQ and MQ competencies, were tested:

Hypothesis 1: Driver plus interpersonal plus intra-personal elements *plus* constrainer will be significantly related to performance.

In the next hypothesis, the constrainer (conscientiousness) is subtracted from the intra-personal elements because it constitutes a constraining force:

Hypothesis 2: Driver plus interpersonal plus intra-personal elements *minus* constrainer will be significantly related to performance.

In the third hypothesis, the IQ and MQ elements are introduced:

Hypothesis 3: Driver plus interpersonal plus MQ plus intra-personal elements plus IQ plus constrainer will be significantly related to performance.

Developing Emotional Intelligence

The analogy of a vessel containing fluid can be used to illustrate the development of elements of EI. The overall capacity of some elements could be increased through training by extending the range of an individual's skills. This is what the authors refer to as being 'developable'. In the original EIQ model (Higgs and Dulewicz, 1999), the enablers fitted into this category. At the other extreme, some elements appear to be more enduring characteristics, probably formed earlier in life, and so could be seen as vessels which are fixed in size. Therefore, experience can increase only the volume of contents within the vessel, not the vessel itself. This is what is meant by 'exploiting' one's capacity. The elements from the original model (Higgs and Dulewicz, 1999) seen to be 'exploitable' are the drivers and constrainters. Further research is reported in this paper to test two more hypotheses:

Hypothesis 4: Scores on the enablers will increase over time after development interventions.

Hypothesis 5: Scores on the drivers and constrainters will not change over time after development interventions.

In the following section of this paper, the findings will be presented from three studies in which assessments of Emotional Intelligence have been conducted on separate occasions, with very different intervening activities between the applications. The results will provide evidence to test the develop/exploit categorization of elements of Emotional Intelligence and correlations with performance data will be used to investigate the hypotheses relating to the revised model of EIQ.

Method and results of three studies

Three studies were reviewed in order to explore the extent to which Emotional Intelligence is amenable to development and the relationship of this to the proposed model of EI. In each study, measures of EI were taken before a specific intervention or event and then again after a period following the intervention or event. The results of the initial assessment were not fed back until after the second assessment, although participants were aware that they were subjects of a study. This procedure followed 'before and after' design principles recommended by many researchers (e.g. Wright and Fowler, 1986; Hair *et al.*, 1995).

In operationalizing the development of EI among participants in each study, a paired sample *t*-test was used for comparing groups before and following development activities. All analyses were carried out on SPSS for Windows, Version 10. A description of the three studies and their findings is now presented.

Study 1: retail company

The study reported here was part of a larger study (Slaski and Cartwright, 2002) examining the relationship between EI, stress, well-being and performance with 224 managers in a large retail organization. It was specifically aimed at evaluating the efficacy of a programme to develop Emotional Intelligence.

Sample A sample of fifty-nine middle managers completed the EIQ and were selected to attend the Emotional Intelligence development programme. Their mean age was 36.3 years; thirty-six (61 per cent) were male and fifteen (25.4 per cent) possessed a degree.

Intervention EI training took place one day per week for four weeks with a one-week break in-between sessions to enable participants to practise and embed previous learning. It focused on the development of self-awareness, detachment, regulation of emotions, recognition of emotions in others and the impact of one's behaviour on others. Training techniques used were lectures, discussions, videos, exercises, dialogue, role play, diaries and one-to-one feedback.

Retesting Managers were tested again on EIQ six months after the final day of training.

Performance Ratings of job performance by their line managers on sixteen performance factors were used as the performance measure in this study (Dulewicz *et al.*, 2003).

Results A paired-sample *t*-test was applied to the managers' two sets of EIQ scores and the results are summarized in Table 1. The full results are reported by Dulewicz *et al.* (2003). They found a statistically significant improvement both on the EIQ total score, and on five of the seven elements at the .001 level (unless stated otherwise, below). Improvements were found on self-awareness, interpersonal sensitivity, influence (.01 level), motivation (.01 level) and emotional resilience. The two elements that showed no improvement over time were intuitiveness and conscientiousness.

Study 2: pharmaceutical company

The team leaders' study, already cited above (Dulewicz and Higgs, 2000b; 2000c), was part of a major continuous improvement initiative (Deming, 1993) within the company. Seventeen projects were set up to address a range of types of problem from 'soft' issues

Table 1 Paired samples *t*-test for training-group mean scores and significant differences for the EIQ and elements pre- and post-EQ training

<i>EIQ elements</i>	<i>Mean score pre</i>	<i>Mean score post</i>	<i>Difference</i>	<i>Sig. level</i>
<i>EIQ total</i>	256.6	268.0	11.4	0.01
Self-awareness	46.7	49.6	2.9	0.01
Emotional resilience	37.1	40.3	3.2	0.01
Motivation	37.7	38.9	1.2	0.01
Interpersonal sensitivity	46.7	49.1	2.4	0.01
Influence	36.9	38.2	1.3	0.01
Intuitiveness	24.5	24.8	0.3	n.s.
Conscientiousness	26.9	27.1	0.2	n.s.

Note

(*n* = 51).

Source: Dulewicz *et al.* (2003).

such as communications to 'hard' issues such as process yields and control documentation. Each project was headed by a team leader (TL), who undertook special CI training to conduct the project. Before this took place, each TL was assessed on the EIQ. A control group, who also completed the EIQ, was also set up, consisting of seventeen managers with broadly similar ages and experience, but who did not undertake any training or lead the special projects.

Sample A sample of twenty-seven was available for retesting, fourteen team leaders and thirteen from the control group. Their mean age was 35.7 years; nineteen (70.3 per cent) were male and a large majority possessed a degree.

Intervention None of the sample undertook any development actions specifically to improve their Emotional Intelligence during this intervening period, although, as noted, the experimental group took part in some continuous improvement development exercises.

Retesting On completion of the project, twenty-seven team leaders and members of the control group retook the EIQ twelve months after the initial assessment in January 2000.

Performance The measure of job performance used was a composite of ratings by the bosses' boss, the HR director and the CEO (Dulewicz and Higgs, 2000b, 2000c).

Results The results of paired sample *t*-tests on the team leaders are presented in Table 2. No difference was found in the overall EIQ score or on six of the elements, but conscientiousness did show a significant difference (0.01 level), with scores improving over time (a negative *t* value reflects an improvement). Further analysis revealed that the experimental group's conscientiousness improved significantly while the control group's did not. Therefore, the overall difference appeared to be due to increases within the experimental group.

Table 2 Paired samples *t*-test on team leaders' pre- and post-EIQ

	Paired differences		<i>t</i> -value	<i>Sig. level</i>
	<i>Mean</i>	<i>SD</i>		
Self-awareness	0.19	1.33	0.72	0.48
Emotional resilience	−0.26	1.38	−0.98	0.34
Motivation	−0.30	1.14	−1.35	0.19
Interpersonal sensitivity	0.15	1.10	0.70	0.49
Influence	0.07	1.21	0.32	0.75
Intuitiveness	0.19	1.39	0.69	0.49
Conscientiousness	0.67	1.24	2.79	0.01
EIQ total	−0.07	0.83	−0.46	0.65

Note

Df = 26.

Study 3: Global Challenge yacht race

The BT Global Challenge round-the-world yacht race covered over 28,000 miles during a period of ten months from September 2000 over seven separate legs. The twelve yachts were all identical and each had one skipper, fourteen core crew and three 'leggers' who took part in single legs. The total crew formed two or three 'watches', each with its own leader. The overall aim of the project was to explore the relationship between the EI and personality factors of skippers and crews, the team dynamics and overall race results (Dulewicz and Higgs, 2002; Dulewicz *et al.*, 2002).

Sample There were fourteen skippers including two reserves, both of whom took part. One dropped out after the first leg and was not included in the analysis. Of the thirteen, their mean age was 31.2 years; eleven were male and a majority possessed a degree. Eleven were from the UK and two were Australian. Turning to the core crew who took part in all legs, 113 were tested pre- and post- race. The large majority were from the UK. Thirty-seven crew were from the boats that finished in the top four and thirty-six in the bottom four.

Intervention No interventions designed specifically to develop Emotional Intelligence were carried out during the race.

Retesting One area that merited special investigation was the extent to which the participants' Emotional Intelligence changed during the race. To do this, the skippers and core crew completed the EIQ before the start of the race in September 2000 and again at the end in June 2001.

Performance The performance measure employed in this study was the aggregate number of points awarded to each boat, the official race result.

Results Individual scores on EIQ before the race and at the end were compared using paired sample *t*-tests. Looking first at the skippers (see Table 3), intuitiveness was the only element to change. The difference was highly significant, at the .003 level and showed an increase through the race.

The results for the core crew appear in Table 4. Scores on two elements (sensitivity and influence) actually declined significantly. However, these findings refer to *all*

Table 3 Paired samples *t*-test on skippers' pre- and post-race EIQ

	Paired differences		<i>t</i>	Sig. level
	Mean	SD		
Self-awareness	0.00	2.89	0.00	1.00
Emotional resilience	0.92	2.50	1.33	0.21
Motivation	−0.23	3.24	−0.26	0.80
Interpersonal sensitivity	1.15	3.58	1.16	0.27
Influence	−0.54	2.90	−0.68	0.52
Intuitiveness	2.46	2.37	3.75	0.01
Conscientiousness	−0.31	3.59	−0.31	0.76
EIQ total	−1.46	12.25	−0.43	0.68

Note

Df = 12.

Table 4 Paired samples *t*-test on crew's pre- and post-race EIQ

	Paired differences		<i>t</i>	Sig. level
	Mean	SD		
Self-awareness	0.40	4.21	1.01	0.32
Emotional resilience	−0.15	4.34	−0.37	0.71
Motivation	0.17	3.61	0.49	0.62
Interpersonal sensitivity	1.52	4.95	3.27	0.00
Influence	0.73	3.10	2.52	0.01
Intuitiveness	−0.07	3.26	−0.23	0.81
Conscientiousness	0.15	3.27	0.49	0.62
EIQ total	0.35	31.09	0.12	0.90

Note

Df = 112.

Table 5 Paired samples *t*-test on bottom four crews' pre- and post-race EIQ

	Paired differences		<i>t</i>	Sig. level
	Mean	SD		
Self-awareness	0.69	3.95	1.06	0.30
Emotional resilience	0.75	4.16	1.08	0.29
Motivation	0.44	3.82	0.70	0.49
Interpersonal sensitivity	2.47	5.39	2.75	0.01
Influence	1.33	3.04	2.63	0.01
Intuitiveness	1.44	3.87	2.24	0.03
Conscientiousness	0.19	3.49	0.33	0.74
EIQ total	−0.19	49.09	−0.02	0.98

Note

Df = 35.

Table 6 Paired samples *t*-test on top four crews' pre- and post-race EIQ

	Paired differences		<i>t</i>	Sig. level
	Mean	SD		
Self-awareness	0.47	4.58	0.64	0.53
Emotional resilience	− 0.79	4.87	− 1.00	0.32
Motivation	− 0.21	4.05	− 0.32	0.75
Interpersonal sensitivity	0.34	4.96	0.43	0.67
Influence	0.42	3.48	0.74	0.46
Intuitiveness	1.03	2.39	2.65	0.01
Conscientiousness	− 0.16	2.68	− 0.36	0.72
EIQ total	− 0.95	18.69	− 0.31	0.76

Note

Df = 36.

core-crew. When one analyses the top four and bottom four crews separately, a different picture emerges. As can be seen from Table 5, sensitivity and influence decreased for the bottom four boats' crew but remained the same for the top four (see Table 6). However, the top four crews' intuitiveness *increased* while it *decreased* for the bottom four (Table 5). Clearly these two results cancelled each other out since the results for the total crew showed no difference (see Table 4).

Testing the revised model of Emotional Intelligence

The revised model was tested by correlating the overall performance measure used in each study with various combinations of EI elements, and also 'IQ' and 'MQ' ratings available for the team leaders and the BT Global Challenge (BTGC) studies. The results appear in Table 7 and show no significant correlations between the BTGC race results and the various combinations of skippers' scores. This is most probably because so many factors other than the skippers' personal qualities had a bearing on the race results. However, the results from the other two studies, where the overall performance of the individuals themselves constituted the measure of performance used, were more positive.

Table 7 Correlations between revised Emotional Intelligence model and performance measures in three studies

Elements of model	Study		
	Retail managers	Team leaders	BTGC skippers
1 Driver + intra-personal + interpersonal + constrainer (hypothesis 1)	0.32*	0.65***	0.01
2 Driver + intra-personal + interpersonal − constrainer (hypothesis 2)	0.30*	0.64***	− 0.26
3 Driver + intra-personal + IQ + interpersonal + MQ + constrainer (hypothesis 3)	#	0.86***	0.10
<i>N</i>	53	27	11

Notes

Study did not include measures of IQ and MQ.

*** Correlation is significant at the 0.001 level.

* Correlation is significant at the 0.05 level.

The revised model highlights the importance of the interpersonal elements as the interface between the intra-personal elements and the work environment. When working with others, the intra-personal elements are brought into play and contribute to performance through the interpersonal elements, sensitivity and influence. In the first equation, the inter- and intra-personal elements and the driver and constrainer were aggregated and then correlated with performance. Row 1 presents the correlation co-efficients, two of which are statistically significant. Thus, this additive model of the elements was statistically significantly related to performance in both the retail and team leader studies.

A variant of the model was then tested, in which a negative weighting was applied to conscientiousness in order to reflect the fact that this is seen as a constrainer. Results for this model – which consists of the driver plus intra-personal elements plus interpersonal elements *minus* conscientiousness (hypothesis 2) – appear in Row 2. This shows statistically significant correlations with performance in the retail and team leaders' studies.

In the team leader and Global Challenge studies, in which IQ and MQ scores were available, the IQ score was *added* to the intra-personal elements and the MQ score to the interpersonal elements. The results for the model – which consists of the driver plus intra-personal elements plus IQ plus interpersonal elements plus MQ *plus* conscientiousness (hypothesis 3) – are presented in Row 3. Highly significant correlations (at the .001 level) were found in the team leaders' study.

Discussion

Within the overall debate on the nature of Emotional Intelligence, there has been considerable discussion around the issue of the extent to which EI can be developed. In broad terms there is an emerging consensus that EI is developable, but with differing views on the extent of development possible (Goleman, 1996, 1998; Higgs and Dulewicz, 1999; Steiner, 1997; Höpfl and Linstead, 1997; Cooper, 1997; Martinez, 1997). Higgs and Dulewicz (1999), in their original model of Emotional Intelligence (above) had proposed that some elements are more readily developable than others. They proposed that the 'enablers' are more amenable to development than the 'constrainers' or 'drivers'. The results of the retail study provide partial support for this proposition, in that all three enablers in their original model – self-awareness and the interpersonal elements, sensitivity and influence – showed highly significant improvements while intuitiveness (originally a driver) and conscientiousness (a constrainer), as expected, did *not* show a significant difference in the pre- and post-training assessments. However, while an improvement had been expected on the enablers, even after only a short course, it had not been expected on motivation (a driver) and emotional resilience (originally a constrainer).

Further support for the proposition that EI can be developed is provided by Dulewicz *et al.* (2003). From an analysis of EQ-i data gathered in the retail study described above, they found improvements in EQ-i scores, based on a comparison of the scores of a 'training' group and a control group before and after the 'training' group had attended the Emotional Intelligence course described above. Table 8 shows those EQ-i factors that had improved after training and the equivalent EIQ elements. Interestingly, the majority of the EQ-i factors which did not change (independence, social responsibility, reality testing, problem solving, stress management, impulse control) could be seen to be conceptually aligned to the drivers and constrainers in the Higgs and Dulewicz (1999) model.

The team leaders in the pharmaceutical company study took the EIQ on two occasions twelve months apart. No differences were found on the overall EIQ score or on six of the elements. However, conscientiousness did show a significant difference, with scores improving over time. As noted above, the experimental group's conscientiousness

Table 8 Summary of Emotional Intelligence elements measured by the EQ-i and the EIQ which improved after training

<i>EQ-i</i>	<i>Equivalent EIQ elements</i>
<i>Intra-personal component</i>	
1. Emotional self-awareness (no significant change)	
2. Assertiveness	Influence
3. Self-regard	Self-awareness
4. Self-actualization	Motivation
5. Independence (no significant change)	
<i>Inter-personal component</i>	
6. Empathy	Interpersonal sensitivity
7. Social responsibility (no significant change)	
8. Inter-personal relationships	Sensitivity and influence
<i>Adaptability component</i>	
9. Reality testing (no significant change)	
10. Flexibility	No equivalent element
11. Problem solving (no significant change)	
<i>Stress management component</i>	
12. Stress tolerance	Self-awareness and resilience
13. Impulse control (no significant change)	
<i>General mood component</i>	
14. Optimism (no significant change)	
15. Happiness	Self-awareness and resilience

Source: Dulewicz *et al.* (2003)

improved significantly while the control group's did not. Therefore, the overall difference was probably due to changes within the experimental group. They were initially selected to lead a number of special projects as part of a 'total quality' continuous improvement initiative and so it is likely that they were focusing on conscientious performance.

In the Global Challenge study, the skippers' EIQ scores on intuitiveness increased through the race. This is perhaps not surprising since the pressures and other demands made on them throughout the race would have probably encouraged them to make ever-more decisions based on intuitiveness as the race progressed. There would often have been little time to make more considered rigorous, rational decisions based on hard data.

Turning to the core crew, their scores on two elements (sensitivity and influence) actually declined significantly, although there were differences between the top four and bottom four boats' crews. Sensitivity and influence decreased for the bottom four but remained the same for the top four. Intuitiveness, however, *increased* for the top four, as found with the skippers, but *decreased* for the bottom four. Clearly, these two results cancelled each other out since the results for the total crew had shown no difference.

Thus, the intuitiveness of skippers and successful crew improved but, not surprisingly, there were no other improvements in EI since no systematic intervention (i.e. EI training) occurred during the race, and skippers and watch leaders were probably in no position to coach their crew in Emotional Intelligence.

It is interesting to note that the two EIQ elements which did *not* show improvements after EI training in the retail study (conscientiousness and intuitiveness) were found to improve with team leaders, and with skippers and top four crews respectively, in very different circumstances. Being drivers and constrainers in the original model, they were probably more difficult to develop, so it is possible that the change was due to the individuals maximizing their potential in these areas when under pressure and the impact of a somewhat extreme situation over a significant period of time.

As noted in the introduction above, Goleman (1996) stated that, while Emotional Intelligence is amenable to development, it is interventions during childhood which are most effective. Indeed, he had some doubts about the efficacy of learning interventions at later stages in life, although his views had changed in his second book in which he proposes a number of broad principles to develop EI (Goleman, 1998: 244–5). Höpfl and Linstead (1997) consider that the core capabilities are developed within childhood but these are malleable and thus capable of being developed and changed; furthermore, workplace experiences have a significant impact on this shaping process. Combining the findings reported above with these views, the seven elements could be seen to lie on a development continuum ranging from ‘easily developable, malleable’ (enablers) through to ‘difficult to develop’, need to exploit one’s capacity formed earlier in life (some drivers and constrainers). In this research, unusual work or other (i.e. sailing) experiences most probably forced or encouraged some individuals to exploit their existing capacities for conscientiousness and intuitiveness. The results of the retail study, which had incorporated EI training, showed that the enablers were improved, as predicted, but also that the capacity for motivation and resilience could be fully exploited by appropriate development action.

The analyses conducted to test the *revised model of Emotional Intelligence* (Table 7) provide fairly strong support. Two hypotheses (H1 and H2) to test the model “‘intra plus/minus conscientious’ *plus* interpersonal elements’ are supported in two of the three studies with the positive weighting of conscientiousness producing marginally larger coefficients than the negative weighting. Furthermore, the team leader study supported the hypothesis (H3) that included IQ as an intra-personal element and MQ as an inter-personal element (Row 3). A substantial increase in the size of the correlations was found compared to those found with the EI elements alone (Rows 1 and 2).

The implications of the results on changes in EI vary between studies for different EI elements. One hypothesis (H4), that the original enablers – self-awareness, influence and sensitivity – will have improved after development action, was confirmed. Using the vessel analogy presented above, their overall capacity could be seen to have increased through training. The final hypothesis (H5), that the original driver and enablers’ scores will not improve over time, was supported in part. Intuitiveness and conscientiousness, which did not improve after training, but did after team leadership and sailing experiences, can be seen as vessels which are fixed in size so that experience can only increase the volume of contents within the vessel. However, results from the above studies show that intuitiveness and conscientiousness can be improved through experience, i.e. team leaders, and skippers and successful crews in their race. This is what is meant by ‘exploiting’ one’s capacity. The other two elements, emotional resilience and motivation, which had previously been considered to be ‘exploitable’ but which showed improvements after training, probably lie between these two extremes. A reformulated

Table 9 The 'develop-exploit' continuum for EIQ elements

<i>EIQ elements</i>	<i>Develop</i>	← ----- →	<i>Exploit</i>
<i>Intra-personal enablers</i>			
Self-awareness	✓		
Emotional resilience		✓	
Intuitiveness			✓
<i>Interpersonal enablers</i>			
Interpersonal sensitivity	✓		
Influence	✓		
<i>Driver</i>			
Motivation		✓	
<i>Constrainer</i>			
Conscientiousness			✓

overview of development action incorporating a continuum of *develop-exploit* is shown in Table 9. However, further research is needed to confirm these propositions. Nevertheless, there is certainly support for the proposition that EI is, to a certain extent, developable. This has implications for organizations in terms of the nature and design of development activities. Given the evidence that EI is related to job performance, it would seem reasonable to propose that organizations should introduce programmes and processes designed to develop the Emotional Intelligence of their employees.

Summary and conclusions

The main finding from this study is that there is evidence to support the widely held belief that Emotional Intelligence is capable of being developed. In particular, the hypothesis that the 'enabler' elements of Emotional Intelligence can be developed after relevant training action was borne out by the improvement of scores observed after training. The two studies without a specific EI training intervention showed more limited changes, even with the enablers. Second, Higgs and Dulewicz's (1999) model of Emotional Intelligence has been revised, in part, to take account of both these findings and the distinction between *inter-* and *intra-*personal elements. Results from two of the studies provide some support for the new model. Third, in an attempt to explain these findings, a 'vessel' analogy has been put forward in an attempt to explain why some elements appear to be more amenable to development than others, which are considered to be 'exploitable'.

The study inevitably had some limitations. The sample sizes could be seen to be relatively small but nevertheless acceptable compared to many other similar studies involving managers or professionals. However, further research is required on the revised model and on the effects of EI training, in particular on the 'develop-exploit' continuum. Finally, future studies of the development of Emotional Intelligence ideally should focus on longer-term programmes and involve groups other than managers.

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