

Can we teach emotional intelligence?*

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ABSTRACT

We conduct a field experiment to test whether (and how) emotional intelligence can be taught effectively in a short course. We randomly assign MBA students to an emotional intelligence course, a resiliency course, and a “placebo” course. We compare their emotional intelligences, as measured by the MSCEIT, before and after the sixteen-hour course. We find that students in the emotional intelligence course increase their MSCEIT score by 5 standard score points, students in the resiliency course by 4 standard score points, while students in the placebo course show no change. Furthermore, in the emotional intelligence course this improvement is positively related to class attendance. Students who never missed class increase their MSCEIT score by 10 standard score points.

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One of the biggest challenges managers face today is improving their subordinates' ability to interact and work together. For these reason, companies are willing to invest substantial amounts of time and money to improve their workers' management and leadership skills. For example, O'Leonard (2008) reports that companies spent around twelve billion dollars in 2007 on management and leadership training, the single largest component of their training budget. In spite of these large investments, there is little scientific evidence whether this type of "soft" skills can be taught in a short period of time. In this paper, we provide such evidence for the specific set of abilities commonly referred to as emotional intelligence.

Since Mayer, DiPaolo, and Salovey (1990) and Salovey and Mayer (1990) pioneered the measurement of emotional intelligence, and the widely read book of Goleman (1995) disseminated the concept among the general public, it has grown into a small industry of education and consulting (Matthews, Zeidner, and Roberts, 2002; Matthews, Roberts, and Zeidner, 2004). Aside from the media hype, there is growing scientific evidence showing that emotional intelligence is correlated with managerial skills (Zeidner, Matthews, and Roberts, 2004; Abraham, 2005; Daus and Ashkanasy, 2005). For example, Rosete and Ciarrochi (2005) and Kerr et al. (2006) find that supervisors with high emotional intelligence scores are considered more effective leaders by their subordinates. Jordan et al. (2002) find that teams with more emotionally intelligent members are more effective and goal oriented. Lopes et al. (2006) report that emotional intelligence scores are positively correlated with workers' rank within their company, their merit pay, their contribution to a positive work environment, their sociability, and their tolerance to stress.

The fundamental question is to what extent is emotional intelligence a natural trait that can be used to indentify good leaders and to what extent is it a skill that can be acquired and taught? The strongest support for the validity of teaching emotional intelligence comes from social and emotional learning (SEL) programs (Zeidner, Roberts, and Matthews, 2002). SEL programs, which have been integrated into school curricula, include topics that are related to emotional intelligence such as emotion regulation and perspective taking. There is evidence that these programs have helped students achieve better academic performance (Zins et al., 2004).

However, these claims have been called into question by Zeidner, Roberts, and Matthews (2002) who survey this literature and conclude that the current evidence is unsatisfactory. They identify four major shortcomings of existing programs for the purpose of assessing their effectiveness in teaching emotional intelligence. First, they tend to be based on unclear definitions of emotional intelligence and thus the courses are too broad and lack clear goals. Second, they are generally taught

by staff that has not been trained to teach emotional intelligence and therefore it is hard to know exactly what the students are being taught. Third, they generally do not test and then retest students to judge the effectiveness of the intervention. Fourth and most importantly, they do not have a robust experimental design. In particular, they do not randomly assign students to emotional intelligence and control courses. Also, since these interventions focus on school children, this evidence does not speak to the question of whether emotional intelligence can be effectively taught to adults as claimed by executive training programs.

The purpose of our study is to test whether emotional intelligence can be effectively taught to business people in a relatively short period of time. We do so by addressing the aforementioned shortcomings. First, to address the vagueness of the concept being taught, we focus on one specific definition of emotional intelligence, namely, emotional intelligence as a set of abilities that enable individuals to analyze their emotions and use them in the reasoning process (Mayer and Salovey, 1997).¹ We measure these abilities with the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which has a number of desirable characteristics: it has high test-retest reliability (Brackett and Mayer, 2003); it is less susceptible to manipulation because it is ability-based; it is uncorrelated with other important individual characteristics such as mood, cognitive skills, and personality traits (Brackett and Salovey, 2006). Second, we hire expert emotional intelligence teachers to impart the course. Third, we give students the MSCEIT before and after the course to measure the effectiveness of the intervention. Fourth, we randomly assign students to the course designed to teach emotional intelligence and to two control courses: a resiliency course based on Seligman (1991) and a “placebo” course that includes modules such as table manners, etiquette, and presentation skills.

We find that emotional intelligence can be taught. Students who were treated with the course specifically aimed at teaching emotional intelligence increased their MSCEIT score by 4.8 percentage points ($p = 0.009$). Students who are treated with the course aimed at increasing their resiliency, a skill that has elements in common with emotional intelligence, experienced an increase

¹ Another approach is to see emotional intelligence as a set of personal characteristics. This personality or trait-based approach (sometimes called mixed models of emotional intelligence, Mayer, Salovey, and Caruso, 2000) is primarily measured through questionnaires of perceived emotional abilities and personality traits. For instance, Bar-On (1997) includes questions to measure an individual’s perceived ability to handle relationships and traits such as optimism. Other examples of this approach include Boyatzis, Goleman, and Rhee (2000), Petrides and Furnham (2003), and Schutte et al. (1998).

of 3.7 percentage points ($p = 0.040$). By contrast, students who attended the placebo course showed no increase in emotional intelligence (their MSCEIT score changed -0.4 percentage points, $p = 0.559$).

Of the four branches that compose the MSCEIT score (i.e., perceiving, using, understanding, and managing emotions) almost the entire effect of the emotional intelligence course manifests in the students' understanding of emotions (where there was an increase of 7.1 percentage points). By contrast, the effect of the resiliency course is divided equally between an improvement in understanding emotions (an increase of 2.5 percentage points) and an improvement in managing emotions (an increase of 2.9 percentage points), that is, an improvement in what Mayer, Salovey, and Caruso (2002) call the "strategic" component of the MSCEIT. On average, neither class improved the experiential component of MSCEIT (i.e., perceiving and using emotions).

When we control for the students' attendance to the course, we find that the effects of the emotional intelligence course are much stronger: students that never missed a class experience an increase in their MSCEIT score of 9.6 percentage points. This increase is present in three of the four branches of the MSCEIT. In other words, only the ability to manage emotions was unaffected by the emotional intelligence course. By contrast, attendance in the resiliency course does not seem to affect the improvement in emotional intelligence.

The rest of the paper proceeds as follows: Section 1 gives a more detailed description of the MSCEIT; Section 2 describes the design and implementation of the courses; Section 3 presents the results from the pre-course MSCEIT; Section 4 presents the results from the post-course MSCEIT and the effect of the intervention; Section 5 concludes.

1. The MSCEIT

The MSCEIT is one of the few and perhaps the most popular ability-based test of emotional intelligence. It is designed to measure emotional intelligence as conceptualized by the four-branch model of Mayer and Salovey (1997). In this model, emotional intelligence is seen as a set of abilities that give individuals the capacity to accurately analyze emotions and, more importantly, use emotions in the reasoning process. In other words, the model is built on a functional view of emotions as carriers of information and emotional intelligence as the ability to understand and use this information to solve problems.

The MSCEIT score is composed of four distinct sets of abilities which are referred to as branches. The four branches are: (i) Perceiving emotions, which consists of an individual's ability to

correctly identify emotions (his own and those of others); (ii) Using emotions (to facilitate thought), which consists of the ability to integrate the informational content of emotions to make effective decisions; (iii) Understanding emotions, which consists of an individual's ability to understand the informational content of specific emotions, and (iv) Managing emotions, which consists of the ability to generate or control one's own emotions to attain specific goals. These four branches are grouped into two areas: experiential emotional intelligence (Perceiving and Using emotions) and strategic emotional intelligence (Understanding and Managing emotions).

The MSCEIT is a set of questions designed to measure each of these four abilities (Mayer, Salovey, and Caruso, 2002; Mayer et al., 2003). For example, in order to assess an individual's ability to perceive emotions, the individual is asked to identify emotions in pictures of faces or to predict the emotions that are triggered by a photograph or a piece of art. As in IQ tests, the degree of correctness is determined with a combination of answers given by experts in emotions (i.e., researchers) and a sample of the general population. For more information on the MSCEIT as a measure of emotional intelligence see Mayer, Salovey, and Caruso (2000; 2004) and Brackett and Salovey (2006).

For the purpose of this study, the MSCEIT has a number of desirable characteristics. First, it has been shown to have a high test-retest reliability (see Brackett and Mayer, 2003), which is important since we administer the test twice in order to measure the students' emotional intelligence before and after the course. Second, in contrast to self-reported measures, it is an ability-based test, and therefore it is less susceptible to wishful thinking by students who, after taking a class exalting the importance of emotional intelligence, might like to think that they have improved their emotional intelligence when in fact they have not.² Third, the abilities measured by the MSCEIT are unrelated to other important individual characteristics (Brackett and Salovey, 2006). For example, of the Big Five traits, MSCEIT scores are unrelated to Neuroticism, Extraversion, and Conscientiousness and are only weakly associated with Agreeableness and Intellect. Moreover, MSCEIT scores are uncorrelated with mood, social desirability, self-consciousness, self-esteem, and math SAT scores, and they are only moderately correlated with verbal SAT scores. These features facilitate the design of both a course targeted to teach emotional intelligence and an appropriate control course with similar goals but with content that is not designed to teach this type of abilities.

² See Brackett and Mayer (2003) and Brackett et al. (2006) for evidence indicating that self-reported measures of emotional intelligence are only minimally correlated with ability-based measures. Incidentally, the same result is seen for ability and self-reported measures of cognitive abilities (Paulhus, Lysy, and Yik, 1998).

2. Methods

As previously mentioned, we designed this study to address the shortcomings of previous research in evaluating the effectiveness of teaching emotional intelligence. In particular, our study is characterized by having control courses and random student assignment. This study was run as part of the Chicago-Templeton MBA Longitudinal Study (CTMLS). The CTMLS is a long-term research project on individual characteristics and economic success. It utilizes data from the 2008 cohort of the University Of Chicago Booth School Of Business. We take the following variables from the CTMLS: the student's gender, age, and measures of cognitive abilities, in particular their GMAT score and their performance on a set of mathematical questions dubbed the cognitive reflection test or CRT (Frederick, 2005). A detailed description of the CTMLS is available in Reuben, Sapienza, and Zingales (2008).

In order to have an initial measure of emotional intelligence, students who are part of the CTMLS sample were invited to take the MSCEIT in the fall quarter of 2006 and, for those who missed that opportunity, the winter quarter of 2008. Taking the test was voluntary, but, in order to provide them with an incentive to participate, students were given the test's personalized feedback, which has a market value of \$35. Of the 550 MBA students, 321 completed the MSCEIT (286 in the fall quarter and 35 in the winter quarter). We refer to the students' score in this first taking of the MSCEIT as their pre-course MSCEIT score.

To attract participants for our study, we offered students of the CTMLS the opportunity to take an additional and free course in the spring quarter of 2008. The course lasted five weeks and consisted of two three-hour long meetings per week. In the final week of class, students took part in a series of tests to evaluate how much they learned during the course. As part of this evaluation, students took the MSCEIT a second time. We refer to their score in this second taking of the MSCEIT as their post-course MSCEIT score. Hence, excluding testing times, there were approximately four weeks with two contact hours per meeting for a total of sixteen hours of effective teaching time. This was a not-for-credit course with no formal assignments. Therefore, any effect that we might find is bound to be a lower estimate of the effect a similar course with the usual five to six hours of assignments per week.

In line with many executive training programs, the course was offered as a way for the students to advance their leadership skills before graduation, and it was suitably named "Advanced Leadership Skills Development." The only requisite for participation was the pre-course MSCEIT. Students were told that three different courses will be offered and that they would be randomly

assigned to one of them. It was made clear that switching between courses would not be allowed, and they were asked to commit to attend all the meetings before knowing the course they had been assigned to. However, there were no formal penalties for nonattendance. As authors of the paper, we also attended all course meetings, alternating between classes to monitor them.

The accepted students were randomly assigned to one of three courses. The first course was specifically designed to teach the four-branch model of emotional intelligence. This course which we refer to as the *EI* treatment, was taught by David Caruso (co-author of the MSCEIT) and Susan Kornacki. It was based on courses designed to teach the abilities measured by the MSCEIT (for more details see, Caruso and Salovey, 2004; Kornacki and Caruso, 2007). While one could be concerned that the course will only improve performance in the MSCEIT and not emotional intelligence more broadly, we saw no evidence that the EI course was designed to “teach to the test.”³ We also introduced a second course designed around the positive psychology concept of resiliency, which is related to but different from emotional intelligence. This course, which we refer to as the *Resiliency* treatment, was based on the research of Seligman (1991) and Beck et al. (1979) and aims to improve emotional reactions to challenging situations (good or bad). It is built around giving students feedback according to their answers to the attributional style questionnaire (Peterson et al., 1982).

The third course, which we refer to as the *Placebo* treatment, focused on various business skills completely unrelated to emotional intelligence. It included: classes on etiquette and dressing style, where students learned the business protocol to make a good impression at work; classes on crisis management, where students were taught what type of behavior that can derail their careers and how to deal with situations like workplace violence, product recalls, and industrial accidents, and classes on “storytelling” where students are taught how to use stirring narratives to motivate discussion and influence others. This course serves as a traditional control treatment, which allows us to evaluate whether simply being part of a course focused on improving leadership skills boosts emotional intelligence.⁴

Students were allocated to each treatment using a stratified randomization process. The stratum was made according to gender in order to preserve a similar ratio of male to female across

³ For example, the class did not include any test items and students were not given assigned readings or a textbook. Furthermore, classes were not lecture based and instead they consisted of exercises, demonstrations, and role playing.

⁴ When presented to the students, the three courses were given neutral names. They were called course G, course S, and course B, respectively, to paraphrase the then-logo of the University Of Chicago Graduate School Of Business (now called the Booth School of Business).

the three treatments. *Ex post*, we checked the means of other important variables across the three treatments (i.e., age, measures of cognitive abilities, and pre-course MSCEIT scores) to ensure there were no significant differences between them (see summary statistics below). Our goal was to have 60 students per course. We only had 151 participants; thus, we kept the EI treatment close to the target number of students and allocated the rest between the other two treatments.⁵ Of the 58 students assigned to the EI treatment, 57 attended the first class and 37 were present to complete post-course MSCEIT. Of the 46 students assigned to the Resiliency treatment, 44 attended the first class and 36 completed the post-course MSCEIT. Finally, of the 47 students assigned to the Placebo treatment, 44 attended the first class and 35 completed the post-course MSCEIT. It is worth remarking that the attrition rate after assignment differs across treatments: it is 36.2 percent in the EI treatment, 21.7 percent in the Resiliency treatment, and 25.5 percent in the Placebo treatment. Even though these rates are not significantly different (likelihood-ratio χ^2 test, $p = 0.241$), they should be taken into consideration in evaluating the cost effectiveness of the class.

Note that as our main statistical analysis is based on within-subject differences between pre-course and post-course MSCEIT scores, our sample is limited to the 108 students who completed the post-course MSCEIT.

3. Pre-course emotional intelligence

In the pre-course MSCEIT, the mean emotional intelligence score for all test takers is 99.4 standard score points and the standard deviation is 14.5 standard score points. Hence, it does not appear that MBA students differ in terms of emotional intelligence from the general population (the population mean MSCEIT score is normalized to 100 standard score points). In Table 1, we present the mean and standard deviation for the students' overall pre-course MSCEIT score and the scores of each of its four branches. Henceforth, we refer to standard score points simply as *points*.

We can see that students who completed the post-course MSCEIT and those who did not take part in the course (see the column titled "nonparticipant") have very similar pre-course MSCEIT scores. We confirm this impression by testing for statistically significant differences between these

⁵ Initially, there were 167 students who consented to the analysis of their data and registered for the course. Of these, 16 withdrew before the random assignment was done. Most of the withdrawals took place because of scheduling conflicts with other courses.

Table 1 – Pre-course MSCEIT standard scores and descriptive statistics by treatment

Note: The table presents means; the standard deviations are in parentheses. The MSCEIT scores refer to the pre-course test.

	Placebo	Resiliency	EI	Nonparticipant	Dropout
Emotional intelligence	98.9 (16.6)	99.7 (12.0)	101.4 (14.3)	98.8 (15.0)	100.5 (13.2)
Perceiving emotions	97.1 (17.8)	96.0 (13.2)	99.0 (12.1)	96.4 (14.3)	98.3 (14.4)
Using emotions	99.1 (14.5)	100.8 (16.9)	101.6 (12.8)	99.4 (15.0)	102.5 (15.1)
Understanding emotions	105.1 (13.9)	107.9 (12.1)	107.1 (15.8)	105.5 (15.1)	106.7 (10.8)
Managing emotions	95.6 (12.1)	97.9 (11.2)	96.3 (11.6)	97.0 (11.9)	95.8 (10.5)
Percentage of women	17.1 (38.2)	25.0 (43.9)	29.7 (46.3)	35.1 (47.9)	31.0 (46.8)
Age	29.0 (2.1)	28.9 (2.9)	28.3 (2.3)	28.3 (2.6)	28.3 (2.6)
Cognitive reflection test	2.8 (1.3)	2.6 (1.2)	2.7 (1.2)	2.4 (1.3)	2.5 (1.5)
GMAT score	711.4 (37.9)	709.4 (34.0)	717.6 (41.0)	703.5 (48.4)	700.2 (41.0)
# of observations	35	36	37	171	43

two groups.⁶ We find that students who completed the post-course MSCEIT and nonparticipants do not differ significantly in the overall pre-course MSCEIT score ($p = 0.525$) or in the score for any of the four branches ($p > 0.480$). This is important because it suggests that our sample does not consist of people with uncommonly high or low levels of emotional intelligence.

We get a similar result if we compare students who completed the post-course MSCEIT with those that signed up for the course, but did not complete it (see the column titled “dropout” in Table 1). We do not find that students who took the post-course MSCEIT and dropouts differ significantly in their overall pre-course MSCEIT score ($p = 0.830$) or in any of the branches’ scores ($p > 0.476$). Again, this is reassuring since it indicates that students who missed the post-course MSCEIT were not those who initially had particularly high or low levels of emotional intelligence.

Table 1 also presents summary statistics for the students’ age, gender, and cognitive abilities (GMAT and CRT scores) and compares the sample of participants and non-participants. We do not find a significant difference in age between students who completed the post-course MSCEIT and nonparticipants ($p = 0.187$). But, we do find that compared to nonparticipants, students who

⁶ Unless it is otherwise noted, we test differences in means by running an OLS regression with dummy variables identifying the different treatments and robust standard errors (White, 1980). Moreover, throughout this section, we report the p -values of two-sided tests.

completed the post-course MSCEIT are significantly less likely to be female (likelihood-ratio χ^2 test, $p = 0.050$), and have weakly significantly higher GMAT scores ($p = 0.070$) and CRT scores ($p = 0.056$). With regard to dropouts, we find that students who completed the post-course MSCEIT do not have a significantly different gender composition, age, or CRT score ($p > 0.394$). Yet, we do find that dropouts have a weakly significantly lower GMAT score ($p = 0.082$). Finally, in line with previous literature, we find that women have significantly higher MSCEIT scores ($p = 0.007$) and we do not find a significant correlation between MSCEIT scores and GMAT scores ($r = 0.042$, $p = 0.457$).

Since the sample of students allocated among treatments was randomized one should expect to find no statistically significant differences across students allocated to the three treatments. However, because of some attrition, we worry that the final sample of students attending may have different characteristics. This is not the case. If we do pairwise comparisons between the three treatments for students who completed the post-course MSCEIT, we find that, in spite of attrition, there are no significant differences in overall pre-course MSCEIT scores ($p = 0.493$) or in the scores of any of the four branches ($p > 0.318$). Similarly, we do not find significant differences in age ($p > 0.164$), cognitive abilities ($p > 0.359$), or in the proportion of women (likelihood-ratio χ^2 tests, $p > 0.206$).

In summary, we find that the random assignment of students to the three treatments worked in the sense of creating three groups (even after attrition) that are statistically indistinguishable at the beginning of the course. This allows us to attribute any changes to their MSCEIT scores to the courses' content and focus. We do find that compared to other MBA students, those who completed the course tend to have higher cognitive skills and are less likely to be female. However this does not pose a problem when making treatment comparisons.

4. Post-course emotional intelligence

4.1 Overall emotional intelligence score

In Table 2, we present, for each treatment, the mean and standard deviation for each the emotional intelligence scores both the pre-course MSCEIT and the post-course MSCEIT. As expected, the mean overall emotional intelligence scores of the students in the Placebo treatment remains practically identical (it changes from 98.9 points to 98.5 points). By contrast, in the other two treatments we see an increase in the post-course score. In the Resiliency treatment, the overall MSCEIT score changes from 99.7 points to 103.3 points, which corresponds to an increase of 3.7 points or approximately a

Table 2 – Emotional intelligence standard scores by treatment

Note: The table presents means; the standard deviations are in parentheses.

	Placebo	Resiliency	EI
Overall emotional intelligence			
pre-course	98.9 (16.6)	99.7 (12.0)	101.4 (14.4)
post-course	98.5 (15.2)	103.3 (14.2)	106.3 (13.4)
Perceiving emotions			
pre-course	97.1 (17.8)	96.0 (13.2)	99.0 (12.1)
post-course	94.7 (15.5)	97.6 (14.6)	100.9 (11.6)
Using emotions			
pre-course	99.1 (14.5)	100.8 (16.9)	101.6 (12.8)
post-course	98.6 (13.3)	101.5 (15.2)	101.7 (11.2)
Understanding emotions			
pre-course	105.1 (13.9)	107.9 (12.1)	107.1 (15.8)
post-course	106.6 (14.2)	110.6 (11.4)	114.7 (13.4)
Managing emotions			
pre-course	95.6 (12.1)	97.9 (11.2)	96.3 (11.6)
post-course	98.0 (13.7)	100.7 (13.4)	97.8 (11.5)
Days absent	0.5 (0.7)	0.6 (1.0)	1.2 (1.4)

quarter of a standard deviation. In the EI treatment, there is an even bigger change as the overall score goes from 101.1 points to 106.3 points, which corresponds to an increase of 4.9 points or approximately a third of a standard deviation.

The change between the pre-course and the post-course scores can also be seen in Figure 1. In the figure, we present the cumulative distribution of the overall MSCEIT score for each treatment. As we can see, in the Placebo treatment the pre-course and the post-course distributions look very similar. However, in the Resiliency and the EI treatments, there is a clear shift to the left.

If we test to see whether the increase in the overall emotional intelligence score is statistically significant, we find a significant increase in the EI treatment ($p = 0.009$) and the Resiliency treatment ($p = 0.040$), but not in the Placebo treatment ($p = 0.559$).⁷ Another, more conservative test

⁷ Throughout this section, we again use OLS regressions with robust standard errors (White, 1980) to test whether differences are statistically significant. Given the clear directional hypotheses, when we test the difference between the post-course scores and the pre-course scores we report the p -value of the one-sided test H_0 : change in score ≤ 0 , H_A : change in score > 0 . Similarly, when testing for differences in MSCEIT scores between treatments, we report the p -value of the one-

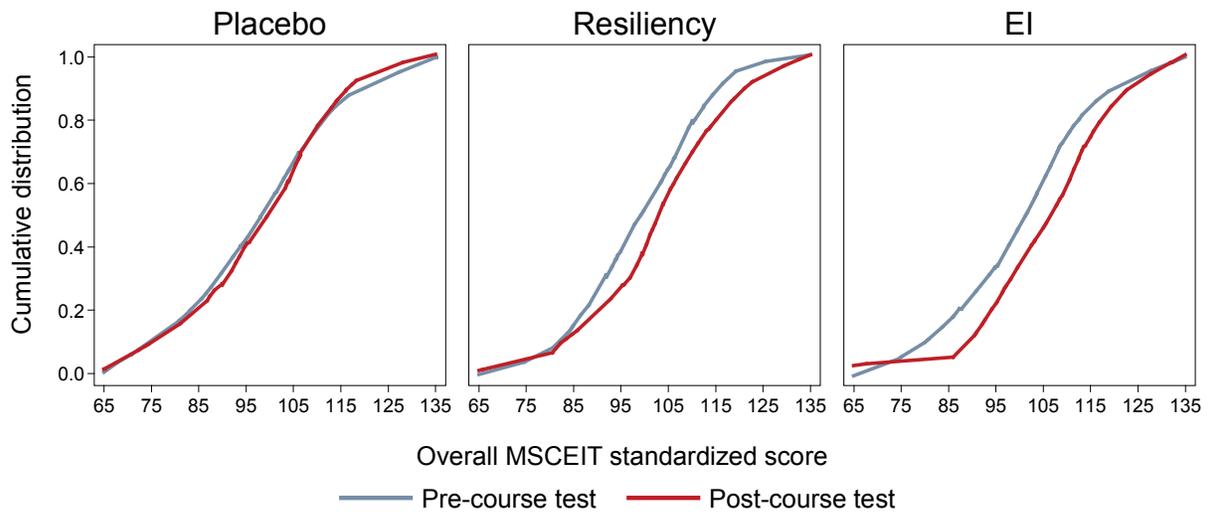


Figure 1 – Cumulative distributions of overall MSCEIT scores by treatment

Note: Cumulative distribution of the overall MSCEIT score for both the pre-course and post-course tests. Lines have been smoothed with locally weighted polynomial regressions.

of the courses' effect is to check whether the post-course MSCEIT score of those students in the EI or Resiliency treatments is higher than that of students in the Placebo treatment. We find that there is indeed a significant difference between the Placebo and EI treatments ($p = 0.012$) and a weakly significant difference between the Placebo and Resiliency treatments ($p = 0.085$).⁸ Hence, the courses that taught aspects of emotional intelligence had the hypothesized effect of increasing the MSCEIT standardized score of a group of randomly chosen students.

4.2 Class participation

If indeed the increase in emotional intelligence in the EI treatment is due to students acquiring new knowledge through class participation then, *ceteris paribus*, students who participate more should on average perform better than those who were occasionally absent. As seen in Table 2, on average, students were absent 0.5 days in the Placebo treatment, 0.6 days in the Resiliency treatment, and 1.2

sided tests H_0 : score in EI \leq score in Resiliency, H_A : score in EI $>$ score in Resiliency; H_0 : score in EI \leq score in Placebo, H_A : score in EI $>$ score in Placebo; H_0 : score in Resiliency \leq score in Placebo, H_A : score in Resiliency $>$ score in Placebo.

⁸ One can also test whether the *change* in scores between the post-course and the pre-course test is significantly bigger in the EI or Resiliency treatments compared to the change in the Placebo treatment. In this case, we get a weakly significant difference between the EI and Placebo treatments ($p = 0.054$) and no significant difference between the Resiliency and Placebo treatments ($p = 0.109$).

Table 3 – Change in emotional intelligence depending on absences

Note: The dependent variable is the difference between the post-course MSCEIT score and pre-course MSCEIT score. The table presents OLS regressions with robust standard errors (shown in parentheses). Asterisks indicate statistical significance for *one-sided* tests at the 10 (*), 5 (**), and 1 (***) percent level.

	Placebo	Resilience	EI
Days absent	2.899 (3.221)	1.389 (1.685)	-3.876 *** (1.325)
Constant	-1.862 (3.276)	2.865 (2.609)	9.626 *** (2.405)
R^2	0.019	0.013	0.178
Observations	35	36	37

days in the EI treatment. The EI treatment clearly exhibits a significantly lower level of class participation than the other two courses ($p = 0.008$).

In Table 3, we present regressions with the difference in the students' post-course and pre-course overall MSCEIT scores as the dependent variable and the number of days each student was absent from class as the independent variable. Note that, with this specification, the constant indicates the estimated change in emotional intelligence for students who never missed class. We run a separate regression for each treatment using OLS estimates with robust standard errors (White, 1980).

In the EI treatment, we find that, on average, students who never missed class increase their MSCEIT score by 9.6 points—which corresponds to approximately two thirds of a standard deviation. We also find that each absence reduces improvement in MSCEIT by 3.9 points (both these effects are significantly different from zero, $p < 0.003$).⁹ In contrast, we do not find such an effect in either the Placebo treatment or the Resiliency treatment.¹⁰ Thus, it does appear that students who attended more EI classes learned more and, consequently, managed to improve their emotional intelligence score by a larger amount.

⁹ We also run these regressions controlling for the students' gender, age, and cognitive abilities. None of these variables is significant at the 5 percent level. Moreover, their introduction does not affect the value or significance of the reported coefficients.

¹⁰ If we run a pooled regression in order to test differences in the coefficients for the number of absences, we find that the coefficient is significantly smaller in the EI treatment compared to the Placebo treatment and the Resiliency treatment (one-sided tests, $p = 0.027$ and $p = 0.008$, respectively).

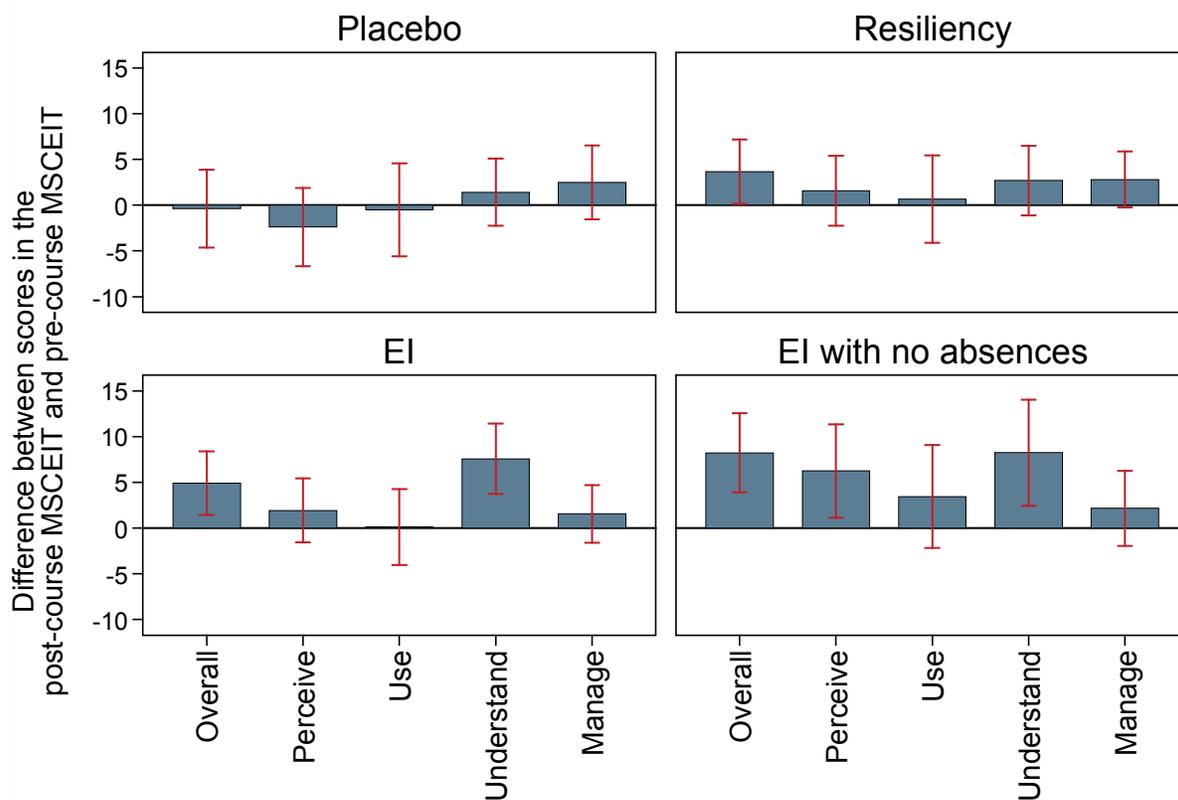


Figure 2 – Difference in emotional intelligence standard scores by MSCEIT branch and treatment

Note: The figure shows, for the overall emotional intelligence score as well as the score of each of the four MSCEIT branches, the mean difference between the participants’ post-course and pre-course scores. Error bars correspond to 90% confidence intervals.

An important caveat to this analysis is that the number of days a student is absent might not measure the amount of knowledge the student acquires. In particular, the number of absences might reflect the effort students put on performing well in their MBA studies. However, the fact that absences do not have a significant effect in the Placebo and Resiliency treatments suggests that the impact of absences is related to the content taught and learned in class and not just to the students’ level of commitment. Nevertheless, it remains an open question whether students who never missed class did better because they learned more due to exposure to more material or because they learned more due to being more motivated by the material being taught.

4.3 MSCEIT branches

In this subsection, we take a look at which branches of the MSCEIT are responsible for the changes in the overall emotional intelligence score. Before the course started, we asked David Caruso how easy

it would be for students to learn the abilities encompassed in each of the four branches. He ranked them from the easiest to hardest in the following order: Understanding emotions, Perceiving emotions, Managing emotions, and Using emotions. The reason is that the abilities in the first two branches can be (partially) improved by simply acquiring knowledge of how emotions relate to each other and of the cues one must look for in order to identify the emotions of other people. In contrast, the abilities included under Managing and Using emotions require the student to learn how to control his or her own emotions, which is harder to achieve.

A simple look at Table 2 reveals that the branch that displays the largest improvement is Understanding emotions, which increases by 7.6 points or approximately half a standard deviation. In comparison, the scores for the other branches do not seem to change much. The change in the scores of each branch can be seen more easily in Figure 2, where we show for each treatment the mean and 90% confidence interval of the difference between post-course and pre-course branch scores. From the first three panels of the figure (i.e., the top-two and bottom-left panels), one can see that the only MSCEIT branch that displays a significant increase in its mean score is Understanding emotions in the EI treatment ($p < 0.001$). Next, we analyze the effect of absences on the MSCEIT branch scores.

In parallel with the previous subsection, we run a series of regressions with the difference between post-course and pre-course MSCEIT scores as the dependent variable and the number of absences as the independent variable. We run one regression for each MSCEIT branch, which gives four regressions per treatment. The estimated coefficients are found in Table 4 in the appendix.

As with the overall emotional intelligence score, in none of the four branches we find that students that never missed class increase significantly their score in either the Placebo or the Resiliency treatments ($p > 0.192$ for Resiliency and $p > 0.200$ for Placebo) compared to the students in the same treatments who did miss classes. Similarly, in neither treatment do we see that the number of absences has a significant effect ($p > 0.634$ in Resiliency and $p > 0.234$ in Placebo).

With regard to absences we find the same pattern in the EI treatment in three of the four branches as for the overall MSCEIT scores. The EI treatment had its strongest effect on students that never missed class. The estimates show that these students have significantly increased their Understanding emotions score by 10.9 points (approximately three quarters of a standard deviation, $p = 0.001$), their Perceiving emotions score by 6.29 points (around a half of a standard deviation, $p = 0.009$), and their Using emotions score by 5.28 points (a third of a standard deviation, $p = 0.041$). The only branch that does not display a significant increase is Managing emotions, which is estimated to have changed by only 1.85 points ($p = 0.229$). These differences can also be seen in the bottom-right

panel of Figure 2, which shows the actual mean difference in the MSCEIT branch scores for students with zero absences. Finally, we ran a single regression with our entire sample (not reported) to check whether students who never missed class in the emotional intelligence class are estimated to significantly increase their scores compared to students in the other treatments who never missed class. Compared to the Placebo treatment, we see significantly higher scores in the EI treatment for Understanding ($p = 0.029$), Perceiving ($p = 0.003$), and Using emotions ($p = 0.039$) and no effect of Managing emotions ($p = 0.453$). Compared to the Resiliency treatment, we see significantly higher scores for Understanding emotions ($p = 0.020$), weakly significantly higher scores for Perceiving emotions ($p = 0.063$) and no significant difference for Using ($p = 0.122$) and Managing Emotions ($p = 0.497$).

As before, we find that especially in the branches where scores significantly increase, the number of absences significantly reduces the magnitude of this change. The negative effect of absences is largest in the Using emotions branch where a one-day absence reduces the positive effect of the EI treatment by 4.2 points ($p = 0.005$). This is followed by the Perceiving emotions branch where the coefficient for number of absences equals -3.6 points ($p = 0.004$), and then by the Understanding emotions branch where the coefficient is -2.7 points and is only weakly significantly negative ($p = 0.069$). In summary, we find that a course targeted to teach emotional intelligence had a strong positive effect on the students' ability to understand emotions and to a lesser extent on their ability to perceive and use emotions, in particular, for students that never missed class.

5. Conclusion

In this paper, we find that a course targeted to teach emotional intelligence can increase scores in an ability-based emotional intelligence test. We also find that a course aimed at increasing the level of resilience can increase, albeit less so, the scores in the same test. While the emotional intelligence course seems to affect three out of the four branches of emotional intelligence, the resiliency course seems to affect only the branches in the strategic area of emotional intelligence. Lastly, we find that the effect of the emotional intelligence course increases with the number of classes attended by the students.

The effect of the emotional intelligence course seems to be large especially for students who attended all classes as their MSCEIT scores increased on average by 9.6 percentage points. If the effects of emotional intelligence are as strong as some of the evidence suggests (Zeidner, Matthews,

and Roberts, 2004; Abraham, 2005; Daus and Ashkanasy, 2005) and the effect of the course is long lasting, then emotional intelligence courses such as the one we investigate can be a worthwhile investment.

Appendix

Table 4 presents, for each treatment, four separate regressions: one for each of the four branches of the MSCEIT. In all regressions the dependent variable is the difference in the students' post-course and pre-course score and the independent variable corresponds to the number of days a student was absent from class. Note that, with this specification, the constant represents the estimated change in emotional intelligence for students that never missed class. The regressions consist of OLS estimates and robust standard errors (White, 1980).

As seen in the table, students who participated in the EI treatment and never missed class show a significant increase in their scores for Understanding emotions, Perceiving emotions, and Using emotions. We also see that in these three branches, the number of absences has a significantly negative effect on the increase in scores. Neither the Managing emotions branch in the EI treatment nor any of the branches in the Placebo and Resiliency treatments show a significant effect for absences.

Note that in the regression for the overall MSCEIT score (see Table 3) and the regressions for the Perceiving and Using emotions (see Table 4) of the Placebo treatment, the estimated coefficient for the number of absences is large and positive, but it is accompanied by a large standard error, and hence, is not significant. This is due to what looks like an outlier in the data: a student who was part of the Placebo treatment, never missed class, and shows a reduction of 53.9 points in his overall score from the pre-course to the post-course MSCEIT (a change of approximately four standard deviations). If we exclude this student and rerun these regressions we get considerably smaller coefficients (in the regression for the overall score the coefficient changes from 2.899 to 1.226, in the one for Perceiving emotions from 5.295 to 4.293, and in the one for Using emotions from 5.471 to 3.896). Similar results are obtained if we use robust regressions instead of OLS regressions.

Table 4 – Change in the branches of emotional intelligence depending on absences

Note: The dependent variables are the difference in the participants' scores between the post-course and the pre-course tests for each branch of emotional intelligence. The table presents OLS regressions with robust standard errors (presented in parentheses). Asterisks indicate statistical significance for *one-sided* tests at the 10 (*), 5 (**), and 1 (***) percent levels.

	Placebo		Resiliency		MSCEIT	
<i>Perceiving emotions</i>						
Days absent	5.295	(3.295)	0.411	(1.324)	-3.582***	(1.318)
Constant	-5.116	(3.079)	1.357	(2.853)	6.289***	(2.615)
R ²	0.061		0.001		0.148	
<i>Using emotions</i>						
Days absent	5.471	(3.547)	0.906	(2.636)	-4.243***	(1.609)
Constant	-3.327	(3.774)	0.135	(3.217)	5.276**	(2.988)
R ²	0.047		0.003		0.147	
<i>Understanding emotions</i>						
Days absent	-2.119	(2.902)	0.946	(2.123)	-2.745*	(1.829)
Constant	2.513	(2.969)	2.134	(2.699)	10.907***	(3.213)
R ²	0.013		0.005		0.072	
<i>Managing emotions</i>						
Days absent	2.086	(5.008)	1.684	(1.745)	-0.250	(2.233)
Constant	1.408	(2.764)	1.821	(2.078)	1.850	(2.476)
R ²	0.011		0.025		0.001	
Observations	35		36		37	

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