Emotional-Social Intelligence in Health Science Students and its Relation to Leadership, Caring and Moral Judgment

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ABSTRACT
The purposes of this study were to describe and compare the emotional-social intelligence (ESI) of students in nursing, physical therapy and health science programs, and to determine the relationship between ESI and each of leadership, caring and moral judgment. Subjects were 154 students from nursing, physical therapy and bachelor of health science (BHSc) programs in a Canadian university and a physical therapy program in an American college. Data were collected by means of self-report measures of ESI, leadership, caring, and moral judgment. The measures included the Bar-On Emotional Quotient Inventory Short (EQ-i:S), the Self-Assessment Leadership Inventory (SALI), the Caring Ability Inventory (CAI), the Caring Dimensions Inventory - 35 (CDI-35) [for nursing only] and the Defining Issues Test (DIT-2) [for physical therapy and BHSc only]. One-way analyses of variance (ANOVA) revealed no differences between groups for the EQ-i:S, SALI, or DIT-2. There were significant differences for the Courage subscale of the CAI between students in the American physical therapy program and in the Canadian nursing program (p=.025). Pearson correlation coefficients were significant for EQ-i:S and each of SALI (r=.53), CAI-Knowledge (r=.59) and CAI-Courage (r=.60). The EQ-i:S scores were not related to the CDI (r=.15) or the DIT-2 (r=-.06). The results of this study confirmed the positive relationship between ESI and leadership and suggested that ESI may be an important construct in caring. There were no major differences between students in different health science programs, and ESI was not related to moral judgment.

INTRODUCTION
Traditionally intelligence quotient (IQ), a measure of cognitive function, has been used to predict the likelihood for life successes including job performance. However, in the last 10 years another set of individual and social competencies labeled emotional intelligence (EI), or emotional-social intelligence (ESI), has been identified and reported to be necessary for individual and workplace success.[1-3] Bar-On defines EI/ESI as;

> "*a multi-factorial array of emotional and social competencies that determine how effectively we relate with ourselves and others and cope with daily demands and pressures.*"[4]

He further suggests that ESI is a determinant of success in life. Along with cognitive intelligence, ESI is an important part of general intelligence, changes over time and can be improved with training.[4]

Emotional-social intelligence would appear to be an important construct, particularly if the measurement of ESI can predict success in life and in specific jobs/careers. Further, if ESI can be improved through training, as claimed by Bar-On[4] and others,[5] then it should be considered in the curricula of educational programs.

In the health care field, professionals require leadership and communication skills in order to work effectively in an ever changing, complex system. They must collaborate with a variety of health providers, facilitate and/or adapt to change within health care organizations, and provide care to individuals with diverse health issues, cultural backgrounds and beliefs.[6] If the measurement of ESI can predict who has these skills, then ESI could be part of the application process for health science students,[7] and/or students could be trained specifically to improve their ESI within the curricula.[8]

Although Bar-On reported moderate to high correlations between ESI and leadership ability, and ESI and work performance,[3] the associations have not been as clear in other publications.[9,10] Bar-On studied recruiters and persons considered for leadership positions in the military, and reported correlations of .39-.82 between ESI and measures of work performance or leadership.[3] McQueen referred to studies that indicated those with higher ESI have better interactive skills, are more cooperative and develop closer relations.[11] These are skills that are valuable in the health professions. Nurses who were identified as "high early career performers" by nurse managers rated characteristics they felt important to their success.[12] These included: ability to empathize, to work with a variety of people, and to learn from their errors. Researchers have suggested that higher ESI may help prevent burnout in nurses.[11,13] However, Farmer found that ESI was not related to job satisfaction in this group.[13]

"Caring" is an important concept in the health professions.[14-16] Definitions vary, but include reference to both the physical actions and emotional concern of the "carer" as he/she supports and responds to the needs of others.[11] Caring has also been described as a relationship that involves receptivity, engrossment and reciprocity of the one caring and the person being cared for.[14] Although several authors have theorized about the importance of ESI in the caring process,[7,11,15] we could find no literature quantifying the relationship between caring and ESI.

As with other claims about ESI, the literature provides conflicting evidence for the link between ESI and academic success. Bar-On reported a correlation of r=0.45 between the ESI at entrance to university and the grade point average (GPA) in the middle of the academic year.[3] Grace found no association between ESI and GPA in nursing students, but did note that some aspects of ESI predicted satisfaction with the educational program.[9] The ESI scores of physical therapy students had a low but significant correlation with academic success,[17] and with scores on 2 out of 24 items on a clinical performance measure.[18] Scott found that ESI was related to moral judgment in Liberal Arts and Career and Technical undergraduate students, with no difference between educational programs.[19]

The specific objectives of this study were to: 1) describe and compare ESI of nursing, physical therapy and bachelor of health science students, and 2) determine if ESI was associated with effective leadership styles, caring, and moral judgment in these students. It was hypothesized that graduate students would have higher ESI than undergraduate, and that students entering a health profession (nursing and physical therapy) would have higher ESI than those entering a general program (bachelor of health science). It was also expected that ESI would be positively correlated with leadership, caring and moral judgment.

METHODS
Design
This study was a cross-sectional, correlational design comparing four groups of students. Ethical approval was obtained from the ethics review boards of the two institutions involved in the study.

Subjects

Four groups of students from two educational institutions (McMaster University, Ontario, Canada and Ithaca College, New York, USA) and three disciplines/programs (Nursing, Physical Therapy, Bachelor of Health Science) were contacted to participate in the study. All the students who were enrolled in the first year of their programs in September, 2006 were informed of the study by e-mail or through announcements in classes/tutorials. They contacted the research assistant if they were interested in participating. All students that participated provided informed consent. As indicated in Table 1, the subjects were from undergraduate and graduate programs, traditional and problem-based programs, and professional and non-professional programs. The sample size calculation indicated that 25 subjects per group were needed to detect a difference of 1 SD with an

alpha of .05 and power of .80. A total of 84 subjects were needed to detect a significant correlation of .3 between measures of ESI and leadership, caring and moral judgment.

Measurement Tools

All data were collected by means of self-report questionnaires which the students filled out in one sitting lasting approximately one hour. All students completed the Bar-On Emotional Quotient Inventory: Short (EQ-i:S), the Self-Assessment Leadership Inventory (SALI), and the Caring Ability Inventory (CAI) in that order. Only the nursing students answered the Caring Dimensions Inventory-35 (CDI-35), a measure designed specifically for nurses. The other three groups completed the Defining Issues Test (DIT-2).

The Bar-On Emotional Quotient Inventory: Short (EQ-i:S) is a self-report measure of emotional and social intelligent behaviors.[3] The EQ-i:S contains 51 items in the form of short sentences. Respondents rate each statement from 1 - "very seldom or not true of me" to 5 - "very often or true of me". A total score and 5 subscale scores can be calculated. The subscales are: intrapersonal, interpersonal, stress management, adaptability and general mood. The results are presented as standard scores based on age and gender. The mean is set at 100, and persons who score between 85 and 115 (one standard deviation) are considered to be functioning effectively. Those who score above 115 are considered to have enhanced ESI and those with scores below 85, to be in need of improvement. Internal consistency was confirmed by an alpha of .97. Intraclass correlation coefficients (ICCs) for test retest reliability were .72 for males and .80 for females.[20]

The Self- Assessment Leadership Instrument (SALI) is a measure of leadership characteristics, where leadership is defined as the process of influencing the behaviors of other persons in their efforts towards goal setting and achievement.[21] This instrument was originally developed in 1970 by Yura and incorporated various leadership theories.[22] Respondents are asked to consider 46 behaviors as they relate to their leadership. A 5-point Likert scale is used indicating, "usually not behave in this manner" (0) to "almost always behave in this manner"(4). A higher total score indicates high self-assessment of leadership characteristics. Testing for reliability produced a Cohen's coefficient K of .54. The SALI was able to discriminate between groups expected to be different on leadership ability.[21]

The Caring Ability Inventory (CAI) is a self- report questionnaire designed to measure the degree of a person's ability to care for others.[23] Although the development of the CAI was based on eight indicators of caring as identified by Mayeroff,[16] factor analysis of the original 80 questions reduced the items to 37 and the subscales to three. Respondents rate each item on a scale from 1-7. Some of these items are reversed scored so that higher values indicate a greater degree of caring. The subscales scores are calculated by summing the items in that subscale. The Knowing subscale [CAI_K] (14 items) includes items on understanding self and others. Courage [CAI_C] (13 items) captures ability to cope with the unknown, and Patience [CAI_P] refers to tolerance and persistence (10 items). Nkongho reported internal consistency of .79 to .84, a test retest coefficient of .75, and a content validity index of .80.[23] Validity of the CAI was further supported by its ability to discriminate between students and nurses and between females and males, by factor analysis, and by results supporting hypotheses consistent with theory.[23]

The Caring Dimensions Inventory – 35 (CDI-35) is a self-assessment questionnaire designed to ascertain nurses' perceptions of what represents caring in nursing, and includes psychosocial, professional, technical and organizational aspects.[24,25] Respondents rate on a scale from 1 (strongly disagree) to 5 (strongly agree) whether they consider each item (nursing activity) to be caring.[26] The higher the score the more likely the nurse considers these behaviors to be caring. Watson noted an ICC of .67 for test-retest reliability of the total score of the CDI-35.[27] An earlier study using the original instrument (CDI-25) demonstrated high internal consistency (Cronbach's alpha = .91).[28] Content validity was addressed through an extensive review of the literature. In the present study, a general caring score was determined by totaling the responses from 22 items that weighed on one factor.[29]

The Defining Issues Test (DIT-2) is derived from Kohlberg's theory of the development of moral judgment, a process by which people determine one course of action is morally right and another course is morally wrong.[30] The process involves defining the moral issues, determining how conflicts are to be settled and having a rationale for a course of action. The test consists of five ethical "dilemmas". For each dilemma, the respondents are asked to make a decision about the action to take and then rate 12 statements (on a 5-point scale) for their importance in making the decision. Finally they rank the 4 most important statements. A number of scores can be computer-generated. The N2 score was used in this study. It is a combined measure of ability to recognize principled items (ranking of these as most important) and to discard the simplistic and biased solutions (rate these lower than principled items). The construct validity has been supported by correlations between the N2 score and moral comprehension, prosocial behavior and civil libertarian attitudes, by differences in age/educational groups, and by longitudinal and interventional changes.[31]

Analysis

The results of all measures were evaluated for fit with a normal distribution. The groups were compared on all measures by means of a one-way analysis of variance (ANOVA), with the alpha set at p<.05. Tukey post hoc analysis was used to determine the location of any significant differences. Pearson's coefficients were calculated to determine the correlation of the EQ-i:S with each of the other measures.

RESULTS

The total number of students enrolled in the study was 154. The distribution of the numbers over the four programs and the characteristics of the students are indicated in Table 1.

Table 1. Characteristics of Subject Groups

Program	N	Male/Female	Age mean (SD)	Education Level	Professional	Education Mode
McMaster Health Science	21	4/17	18 (0.5)	Undergraduate	No	Problem-based
	205	*84/121*	*18*			
McMaster Physiotherapy	21	1/20	24 (4.0)	Graduate	Yes	Problem-based
	59	*9/50*	*25*			
McMaster Nursing	73	5/68	20 (3.5)	Undergraduate	Yes	Problem-based
	385	*39/346*	*20.5*			
Ithaca Physical Therapy	39	7/32	20 (2.1)	Undergraduate /Graduate	Yes	Traditional
	67	*18/49*	*21*			
Total	154	17/137	20.4 (3.4)			
The numbers in *italics* are the values for the entire class from which the sample was drawn.						

The means and standard deviations of all the measures are indicated in Figure 1 and Table 2. The means of the total and subscale scores of the EQ-i:S were within the effective functioning range for all student groups (Figure 1), with no significant differences between groups. The ANOVAs were significant for CAI_C (p=.032) and CAI_P (p=.045) only. Tukey post hoc analysis revealed differences between McMaster Nursing and Ithaca Physical Therapy for CAI_C (p=.025) but not for CAI_P (p=.100).

Three ANOVA F values were close to significance: EQ-i:S total (F=2.4, p=.068), EQ-i:S mood (F=2.5, p=.063) and SALI (F=2.1, p=.098). In all cases the major differences were between McMaster Nursing and Ithaca Physical Therapy, with Nursing being lower in both EQ-i:S and SALI scores.
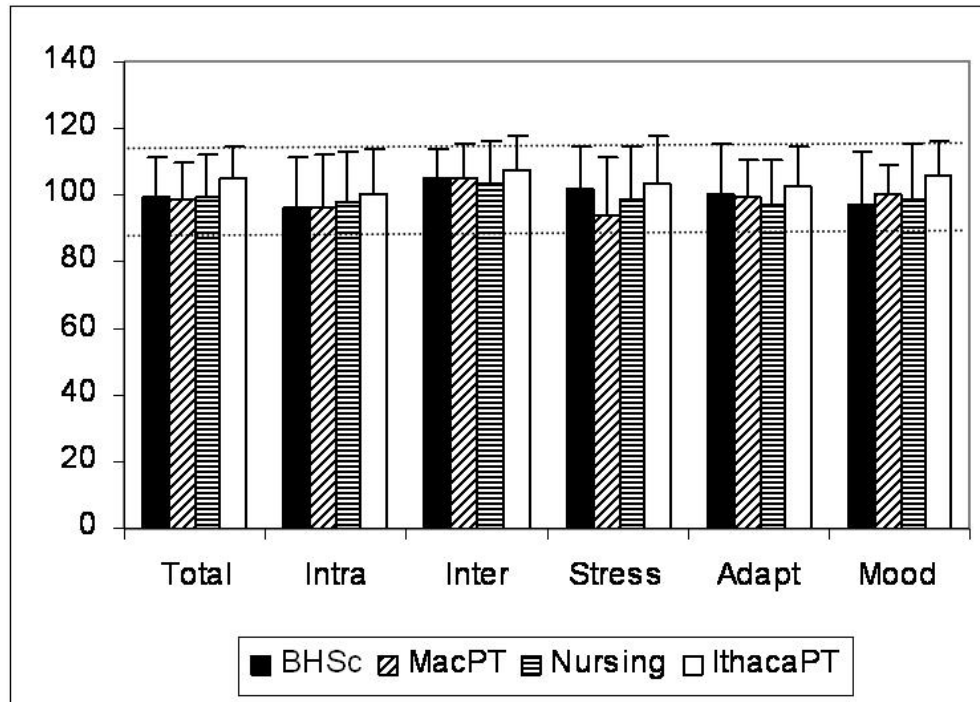
Figure 1. Eq-i:S scores (total and subscale) for the four student groups. Subscales are: Intrapersonal (Intra), Interpersonal (Inter), Stress Management (Stress), Adaptability (Adapt) and General Mood (Mood). All scores between the dashed lines are considered to be in the effective functioning range for ESI. There were no significant group differences for any of the scores.

Table 2. Means and standard deviations () for measures of ESI (EQ-i:S), leadership (SALI), caring (CAI and CDI) and moral judgment (DIT-2) for students in the four programs.

Program	EQ-i:S Total	SALI	CAI_K	CAI_C	CAI_P	CDI	DIT
McMaster BHSc	99.4	117.7	74.2	65.7	60.1		49.1
	(12.2)	(16.1)	(8.8)	(6.7)	(5.3)		(8.8)
McMaster Physiotherapy	98.3	118.7	78.0	67.1	62.3		47.7
	(11.4)	(13.8)	(5.7)	(8.9)	(5.6)		(11.0)
McMaster Nursing	99.2	112.9	76.9	63.4	59.4	97.2	
	(13.2)	(19.3)	(9.0)	(9.7)	(5.4)	(16.8)	
Ithaca Physical Therapy	105.0	122.2	79.0	68.5*	61.8		44.0
	(9.3)	(17.1)	(5.3)	(8.3)	(4.2)		(13.6)
Total	100.6	116.7	77.2	65.5	60.5		45.4
	(12.1)	(17.9)	(7.9)	(9.1)	(5.2)		(12.5)
* significantly different (p<.05) from McMaster Nursing							

Table 3 lists the correlations of the EQ-i:S and its subscales with each of the other measures. All EQ-i:S scores were significantly correlated with the SALI and the CAI_K, but not with the CDI-35 or the DIT. The CAI_C and CAI_P had mixed results.

Table 3. Correlations of the EQ-i:S total and subscale scores with leadership (SALI), caring (CAI and CDI) and moral judgment (DIT)

EQ-i:S	SALI	CAI_K	CAI_C	CAI_P	CDI	DIT
Total	**.53**	**.59**	**.60**	.07	.15	-.06
Intrapersonal	**.41**	**.41**	**.51**	-.14	.05	-.02
Interpersonal	**.29**	**.48**	**.40**	**.31**	.21	-.07
Stress Management	**.28**	**.27**	**.41**	.07	.19	.13
Adaptability	**.41**	**.31**	.07	**.20**	.04	-.09
General Mood	**.36**	**.48**	**.52**	-.01	.03	-.20
correlations **in bold** are statistically significant (p<.05)						

DISCUSSION

Our results demonstrated the expected relationship between ESI and leadership and ESI and general caring, but no relationship between ESI and moral judgment and ESI and perception of caring in nursing. In addition, there were no differences in ESI between students in the four programs.

The students in this study had "normal" EQ-i:S values. Figure 1 demonstrates that the means for groups and subscales were all approximately 100 with a SD of 15, average values for standard scores. Likewise the mean CAI values for all student groups fell within the range for "medium norms" for college students.[23] On the other hand, the mean values for the DIT were higher than those outlined for undergraduate and master's students.[32] No normative values were found for the SALI or the CDI.

The relationship of ESI to leadership has been reported before.[3] Many of the previous studies have reported on leadership characteristics of individuals as evaluated by others.[3,11] In our study, the correlation between ESI and leadership was still significant and positive, although we used self-report of both leadership (SALI) and ESI (EQ-i:S).

Our findings indicated that most of the EQ-i:S scales were correlated with general caring as measured on the CAI. Although the relationship between ESI and caring had not been evaluated before, we had hypothesized that many of the characteristics described as ESI would be necessary to be a caring individual. The results supported that concept. On the other hand, the perception of caring in nursing was not related to EQ-i:S scores. This result could be due to the difference in the type of question asked in the CDI and the CAI. In the CDI, respondents are asked to rate how much they agree or disagree that selected nursing activities involve caring. The CAI, on the other hand, has students rate themselves in terms of caring characteristics. Moreover, Warelow and Edward suggested that caring must be considered in context, and that it incorporates both personal characteristics and cognitive and technical abilities.[15] The CDI questions were not linked to specific situations/scenarios, and the students had as yet not developed any nursing skills.

This study did not find a relationship between moral judgment and ESI. Because moral judgment involves considering a problem from many different perspectives, it was thought that there would be a relationship between the EQ-i:S and the DIT-2. A previous study had reported that the EI was a predictor of moral judgment as measured by the DIT-2.[19] However, the students were not in health sciences, and EI was measured by the Mehrabian's General Emotional Intelligence Scale (GEIS) rather than the EQ-i:S as in the present study. Scores on the DIT-2 have been related to cognitive ability.[33] Therefore it is possible that moral judgment is more closely linked with IQ than with ESI, at least as measured by the EQ-i:S. Since we did not use any traditional measure of intelligence or academic performance in this study, we were unable to determine the amount of variance in the DIT that might be due to different measures of intelligence.

There are characteristics of the sample that may have influenced the results. All participants were volunteers and, except for Ithaca Physical Therapy, represented less than 50% of the total number of students in the first year of their specific program. Thus, it is possible that the sample included students who were more self-assured or had a greater interest in ESI than the general student population. It is also possible that the subjects wanted to display "socially desirable" behavior by volunteering for the study. However, investigators did not know the identity of the student participants from their own program. Because three of the programs had very high admission standards: 3.7/4 mean GPA for McMaster Physiotherapy, 93% average for the Bachelor of Health Science Program, and 3.4/4.0 for Ithaca Physical Therapy, the successful applicants might have had above normal ESI

as well as IQs at time of entry. Finally, all these students were in health science. Students in the Bachelor of Health Sciences program were not training for a specific health profession, but historically many of the graduates of this program apply to medicine and other health professions.[34] Students selecting health professions might be expected to be more aware of their concerns for and interactions with others.

The gender distribution in the sample may be another factor affecting the results. Although all the programs in this study generally have more females than males, the males were still under represented. There are known gender differences in EQ-i:S, CAI and DIT scores.[3,23,35] The gender effects on EQ-i:S tend to be small and do not affect the total score.[3] Females were found to have stronger interpersonal skills but lower intrapersonal and stress management scores.[3] However, the EQ-i:S scores used in our study were standardized for age and gender. For both the CAI and DIT-2, women score slightly higher than men.[23,35] A brief report indicated that gender was a significant independent variable in a regression analysis of the CDI-25, but the strength of the relationship (e.g., R^2) was not provided.[36] Unfortunately, there were not enough male subjects in the present study to examine the effect of gender.

The differences in sample sizes could also affect the results. There were a larger number of students from McMaster Nursing and Ithaca Physical Therapy, and therefore differences would more likely be significant between these groups. All the differences that were significant or approaching significance were in fact between these two groups. Both the BHSc and McMaster Physiotherapy groups had 3 fewer subjects than recommended from the sample size (n=25) estimate. If larger samples had been obtained from these groups, they may have demonstrated significant differences as well.

There could be other reasons, besides sample size, that contributed to differences between Ithaca Physical Therapy and McMaster Nursing. If the differences were due to country or choice of educational style (problem-based versus traditional), Ithaca Physical Therapy should have been significantly different from the other Canadian groups. If differences were related to students who chose physical therapy compared to those who chose other health professions, then the students from McMaster Physiotherapy should have been different than nursing as well. It may be that level and type of education, place in the program, admission standards and Canadian versus American, together, all played a role in distinguishing between Ithaca Physical Therapy and Nursing. Nursing students were mainly from high school, were at the beginning of their program, were starting a new method of education and were in the Canadian system. Ithaca Physical Therapy students, although at the beginning of their professional program, had already completed two "pre-professional" years within the Physical Therapy Program, were continuing with similar methods of education and were in the American system of education. On the whole, there were few differences in the scores between groups, and the results did not support the hypotheses that ESI scores would be higher in graduate versus undergraduate students, and in health professional versus general health science students.

One limitation of this study is its cross-sectional nature. Academic programs would like to use a measure such as the EQ-I:S to predict future ability/success of applicants or to evaluate the effectiveness of intervention programs.[7] However, there is little information on the ESI of health professionals and of students training for these professions. Thus a starting point for research is to describe and compare the ESI of university students in different disciplines and to determine if these scores are related to other constructs as theoretically expected. Ultimately a longitudinal study must be conducted to determine whether ESI at entry to a program can predict success in a health profession, and to establish whether ESI can be developed through training and contribute to professional competence.

It is also possible that a bias was created from the order of presentation of the questionnaires. A decision was made to present the EQ-i:S first because ESI was the major construct of interest, and we did not want the students' responses influenced by the items in the other instruments. However, the questions on the EQ-i:S may have affected how the students answered the other questionnaires. The comparison between groups should not be affected because the order was the same for all students.

In summary, the results of this study confirmed the positive relationship between ESI and leadership and suggested that ESI may be an important construct in caring. There were no major differences between students in different health science programs or in undergraduate and graduate programs, and ESI was not related to moral judgment.

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