CHAPTER 1: INTRODUCTION

1.1 Overview

In the A/E/C industry, the major project participants include the owner, the architect, the contractor and the subcontractors. Traditionally, each participant's activity in the construction process centers around its particular organization's goals. In recent years, one of the leading trends of project delivery systems has been a movement toward a more collaborative, teaming environment. Successful collaboration requires effective interaction among project participants. A fundamental understanding of barriers and challenges to effective interaction among a diverse project team is necessary towards creating truly collaborative project teams in construction.

Interaction involves individuals acting together and/or toward one another. When considering the quality of interaction, it becomes apparent that emotional awareness and emotional regulation are important factors. In order to gain a better understanding of the fundamental elements of effective interaction, it is important to investigate these emotional factors. The theory of "emotional intelligence" addresses these emotional factors.

Emotional intelligence refers to one's ability to identify emotions in oneself and others and the ability to exhibit appropriate responses to environmental stimuli. By investigating emotional intelligence among construction project participants, this research will create a better understanding of the underlying obstacles of effective interaction.

1.2 Purpose of Study

As the A/E/C industry accepts new methods of delivering projects, special attention must be given to the changes made to the definition of a successful project. With the increased need for collaboration produced by new delivery systems, communication and teamwork within the project team become more important. However, before proposing how communication and teamwork can be improved, it is necessary to understand the current barriers and challenges that project participants face.

This study is part of a larger phased research project that applies the theory of emotional intelligence to investigate the different project participants' levels of "soft" skills and abilities. Insight into emotional intelligence of project participants will assist in the identification of areas to focus on improving, especially in regards to the improvement of communication and teamwork within the construction project team.

More specifically, this study provides an exploratory investigation of emotional intelligence within the General Contracting sector of the A/E/C industry. The significance of this study is twofold: future research and practice. First, in terms of research, this study will provide a springboard onto which future research can be initiated. In addition to propelling the future research, this study will also assist in providing specific direction for the research.

Second, in regards to future practice, academic institutions and General Contracting firms will benefit. The results of this study will provide information regarding the emotional strengths and weakness of current members of the General Contracting sector. It will also give an insight into what perceptions the General Contracting sector has regarding other A/E/C sectors. This information can then be used to modify academic courses, as well as company training programs, to concentrate on specific "emotional" areas that need improvement.

1.3 Scope Limitations

There are several limitations that restrict the scope of the present study. The first limitation pertains to the sample population. While considering the researcher's Master's Thesis time frame, it is not practical to perform this investigation for the entire A/E/C industry. Therefore, only one sector of the industry will be considered for this research study. This sector will be General Contracting sector. The researcher has made this decision because of the experience possessed within this sector as opposed to the other sectors.

An additional limitation in regards to the sample population involves the recruitment of companies to participate. There are several reasons for this. First, due to the financially-limited reach of this study, the researcher will be restricted to recruit only those companies located in the Mid-Atlantic region. In addition to this constraint, it is difficult to find construction companies willing to take the time to participate in a study. One final limitation in regards to the sample population is that participating companies will be required to cover the cost of the materials for the testing instrument. These complications regarding the sample population could possibly lead to a smaller sample size than desired.

In addition to sample population limitations, the scope of the objectives will also be limited. These limitations are due to the researcher's time frame of a Master's Thesis. The current study will only address the objectives described in the Objectives portion of this Introduction section. Once these objectives have been addressed, the researcher will only offer recommendations for future research.

In summary, this study will only explore emotional intelligence in the General Contracting sector of the A/E/C industry located in the Mid-Atlantic region of the United States. However, the participation will include all positions within those organizations, as is discussed in more detail as part of the Research Methodology section of this study. In addition, the study will only focus on the developed objectives and will only offer future recommendation for anything beyond.

1.4 Specific Objectives

The purpose of the proposed research study involves benchmarking and exploring the emotional intelligence of the General Contracting sector of the A/E/C industry. More specifically, the study will answer several questions concerning members and groups of members of General Contracting organizations. However, before examining these questions, it is important to define several terms:

- EQ refers to how the assessment instrument of this study defines emotional intelligence.
- Field employee refers to those who directly contribute to the physical construction of a project.
- Office employee refers to those who support the actions of the Field employees.

The following are 10 specific objectives that this study will address:

1. *GC EQ Summary*: How does the General Contracting sector as a whole measure on EQ?
2. *Age*: Does age effect how employees measure on EQ?
3. *Experience (Industry Type and Years)*: Does job experience effect how employees measure on EQ?
4. *Position Level*: Are there differences in EQ scores by position level?
5. *Field vs. Office Employee*: Are there differences in EQ scores between Field and Office employees?

6. *A/E Interaction*: Are there differences in EQ scores between employees with different Architect/Design Engineer interaction?
7. *Company Size*: Are there differences in EQ scores between large-volume and small-volume General Contractors?
8. *GC Perceptions*: How does the General Contracting sector perceive the EQ of other sectors within the A/E/C industry?
9. *Self-Perception of Empathy*: Does there exist a relationship between how employees, themselves, view their ability to perceive others' emotions and their EQ-I Empathy score?
10. *Self-Perception of Interpersonal Relationship*: Does there exist a relationship between how employees, themselves, view their ability to interact with others and their EQ-I Interpersonal Relationship score?

CHAPTER 2: REVIEW OF LITERATURE

2.1 Trend Toward Collaboration

Traditionally, the choice of project delivery systems has been the systematic process of design, bid, and build (DBB). For this system, the participants are primarily concerned with their "piece of the pie." There are two fundamental drawbacks from this method. First, this approach drives the participants to be cautious of one another's motives and actions. Each participant has its own values, goals and orientations, while cooperation is not always the greatest concern (Bresnen and Marshall 2000).

Another disadvantage of the traditional DBB delivery system is the rigid structure that it creates between participants. This inflexible environment makes it difficult to encourage the development of innovative practices and to respond quickly and effectively to new market trends (Belle 1994).

To address these drawbacks of the traditional DBB delivery system, there has emerged several new delivery systems. In recent years, the A/E/C industry has observed a great shift toward the application of "alternative" project delivery systems. These include, but are not limited to: design/build, joint ventures, partnerships, alliances, and construction management. Each of these delivery systems are unique in their own way. However, they all share one thing in common; they all include single-source authority (Metcalf-Kupres 2001).

Using a single-source authority delivery system requires all participants to collaborate and work together in order for a project to be successful. Numerous studies have confirmed this relationship. Thamain's research in 1992 investigated the top 30 potential problems that were a factor in unsuccessful projects. His results indicated that these 30 problems could be classified into five groups:

1. Problems with organizing the project team
2. Weak project leadership
3. Communication problems
4. Conflict and confusion
5. Insufficient upper-management involvement

All five of these problem groups involve the use, or lack, of "soft" skills. Recent research indicates that the A/E/C industry is starting to realize the critical impact that "soft" skills have on the success of projects, especially for "alternate" project delivery systems (Thamhain 1992; Pocock, Liu et al. 1997; Loosemore 1998; Thomas, Tucker et al. 1998; Black, Akintoye et al. 2000; Bresnen and Malouff 2000; Bresnen and Marshall 2000; Shenhar 2000; Cheng and Li 2001; Ling 2002; Singh 2002). Ling, in particular, investigated and identified, from a contractor's point of view, what important "soft" skills consultant Architect/Engineers need to possess (Ling 2002).

This research study intends to continue the current "soft" research ideas in the A/E/C industry and extend upon the ideas of Ling and others. In particular, the researcher proposes to apply the theory of "emotional intelligence." Measuring project participants' levels of "soft" skills and abilities (emotional intelligence) will provide a better understanding of the challenges and barriers impeding effective collaboration.

2.2 What is Emotional Intelligence?

In the past five years, emotional intelligence has gained considerable popular attention. Much of this can be attributed to the popular book *Emotional Intelligence* written by Daniel Goleman. In his book, Goleman makes several strong claims about the contributions of emotional intelligence to the individual and society. As a result of these claims, the general conception of emotional intelligence has become commonly known and has appeared in many magazines and newspaper articles (Mayer, Salovey et al. 2000).

At first glance, emotional intelligence might appear to be a new concept, but it has actually been studied for many years. Emotional intelligence extracts its ideas from the concept of "social intelligence." E.L. Thorndike first coined the concept of "social intelligence" in 1920 (Young 1996). According to Thorndike, "social intelligence" is defined as "the ability to understand and manage men and women, boys and girls…to act wisely in human relations" (Thorndike 1920). In 1983, Howard Gardner, a psychologist at Harvard University, included the concept of "social intelligence" as part of seven intelligences in his newly proposed "Theory of Multiple Intelligences." Gardner broke up the concept of "social intelligence" into two parts, interpersonal and intrapersonal intelligences. Interpersonal intelligence refers to the ability to effectively communicate with and respond to others. Whereas intrapersonal intelligence refers to the ability to understand oneself and to use such information effectively in regulating one's life. It is the distinction between Gardner's inter- and intrapersonal intelligences that represents the foundation of emotional intelligence theory (Scheusner 2002).

The term "emotional intelligence" first appeared in print in an article authored by Peter Salovey and John D. Mayer in 1990. Salovey and Mayer defined emotional intelligence as "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (p. 189). Their framework of emotional intelligence is a developmental model and is comprised of four different levels. The most basic level involves learning how to perceive and express emotions in oneself and others. The second level is where one learns to use emotions to help make decisions. As part of the third level, one learns to understand and analyze emotion. The fourth and highest level involves learning how to manage and regulate one's own and others' emotions (Mayer, Salovey et al. 2000).

While Salovey and Mayer have concentrated on defining the skills of emotional intelligence, others have begun to focus on the results. In contrast to Salovey and Mayer, Goleman (1995) defines emotional intelligence in a more performance-based manner. His framework is much broader and takes into account such competencies as happiness, motivation, empathy and conscientiousness. Goleman's latest model divides 20 competencies into 4 clusters: Self-Awareness, Self-Management, Social Awareness and Relationship Management. Self-Awareness involves being aware of and understanding one's own feelings. Self-Management involves effectively and constructively controlling one's emotions. Social Awareness involves identifying with and feeling part of one's social group. Finally, Relationship Management involves understanding and influencing others' emotions (Goleman 2001).

Similar to Goleman, Reuven Bar-On's approach to emotional intelligence focuses on real world results. Bar-On states that emotional intelligence plays an important role in how well one succeeds in life, copes with daily situations, and gets along in the world (Bar-On 2002). Bar-On was the first to coin the term "Emotional Quotient" or "EQ". Like Salovey and Mayer, Bar-On relies heavily on Gardner's work. Bar-On has defined EQ as "an array of personal, emotional, and social abilities and skills that influence one's ability to succeed in coping with environmental demands and pressures" (p. 4). Bar-On has also created a framework grouping 15 factors into 5 distinct areas: Intrapersonal, Interpersonal, Adaptability, Stress Management and General Mood.

The aforementioned researchers are responsible for creating the three most prevailing frameworks of emotional intelligence. Salovey and Mayer have decided to use a very academic, internal approach. Goleman and Bar-On have taken a more applicable, performance based approach. However, all three models share in common the reference to emotional intelligence as the ability to accurately perceive, evaluate, regulate and express one's own emotions.

2.3 Why Emotional Intelligence?

Much of the research conducted on emotional intelligence focuses on how it relates to workplace success. More specifically, there have been many studies conducted to analyze the impact of emotional intelligence on individuals' leadership ability and job performance (Scheusner 2002).

Research demonstrates that leadership greatly impacts many aspects of organizational effectiveness to include, production, quality, efficiency, flexibility, satisfaction, competitiveness, and development (Gibson, Ivancevich et al. 2003). This makes it important to search for what distinguishes outstanding leaders. Emotional intelligence accounts for close to 90% of what sets apart exceptional leaders from those deemed as average (Kemper 1999). In addition, in a study involving 49 top business leaders, three of the top five skills identified as key leadership skills relate to interpersonal components of emotional intelligence (Scheusner 2002).

The Interpersonal aspect of emotional intelligence focuses on how people relate to others and the environment. To ensure top performance of an organization, employees must be able to communicate effectively. This realization has become much more visible in recent years. Organizations are now demanding that employees possess increased levels of such skills as teamwork and trustworthiness (Kemper 1999). With the addition of the emphasis on teamwork, group performance becomes critical. Fortunately, emotional intelligence has been linked to higher group performance (Williams and Sternberg 1988; Ashforth and Humphrey 1995; Campion 1996; Goleman 2001). When an emotion enters into a group situation, any response by any member affects the relationships among all members, generating more emotions (Folkman and Lazarus 1988). Therefore, to promote group effectiveness it is important for members of the group to exhibit appropriate and emotionally intelligent responses.

Another beneficial aspect to note about emotional intelligence is that it is an intelligence (Mayer, Caruso et al. 1999). As such, emotional intelligence can be improved through maturity and training. Research completed by Fabio Sala (2000) supports this statement. The results of Sala's studies show an improvement in emotional intelligence of individuals who participated in emotional intelligence training programs.

However, to effectively train an individual, it is important to understand how the training should be focused. To achieve this, it is important to evaluate the level of the individual's emotional intelligence and expose the individual's strengths and weaknesses. This involves the assessment of an emotional intelligence inventory.

2.4 Assessment of Emotional Intelligence

There exist a number of currently available measures of emotional intelligence (Gowing 2001). The three prevailing test instruments are in alignment with the three frameworks previously discussed. These three instruments are: the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT), the Emotional Competence Inventory (ECI), and the Bar-On Emotional Quotient Inventory (Bar-On EQ-i). These instruments all vary in the descriptions of the constructs they measure and the manner in which they are assessed.

The MSCEIT has been developed to measure the four branches that define the Mayer and Salovey model of emotional intelligence: Perceiving Emotions, Facilitating Thought, Understanding Emotions, and Managing Emotions. The first branch section of the test measures how well subjects perceive emotions in Faces, Music, Designs, and Stories. The second branch section measures Synesthesia Judgments and Feeling Biases. Subjects are given stimuli and are asked to respond. For the third branch section, subjects are given various stimuli and are asked to show their understanding of the emotions involved. The fourth branch section measures Emotion Management in the Self, and in Others. Subjects are given scenarios to rate the appropriateness of given reactions (Mayer, Salovey et al. 2000). From analyzing the constructs and the assessment of this instrument, it is safe to conclude that the main focus is on the internal aspects of emotional intelligence within an individual (Gowing 2001).

The ECI (Gowing 2001) differs from the MSCEIT in that it is more performance, behavior based. Richard Boyatzis and Daniel Goleman developed their instrument to measures the four clusters of Goleman's latest framework of emotional intelligence:

Self-Awareness, Self-Management, Social Awareness, and Relationship Management. The ECI is a 360-degree tool, meaning that it reflects self, subordinate, peer, and supervisory feedback. Feedback is given using a 6-point scale to rate each of Goleman's 20 competencies. Although this instrument seems to have great potential for individual and organizational development, it is still very young and unproven.

A third instrument, one that is more of a cross between the academic MSCEIT and the performance based ECI, is the Bar-On EQ-i. Based on over 20 years of research by Dr. Reuven Bar-On, the EQ-i was the first test of emotional intelligence to be published by a psychological test publisher (Multi-Health Systems in Toronto). The EQ-i measures "abilities and the potential for performance" (Bar-On 2000). This instrument returns a total "EQ" score on the basis of 5 composite scales and 15 subscales. The 5 composite scales measured, which are discussed in more detail in the Methodology section of this study and Appendix F, are: Intrapersonal, Interpersonal, Adaptability, Stress Management and General Mood. The EQ-i is a self-report, where the score is a reflection of the subject's answers to the test questions.

The EQ-i has been used and improved for over a decade now. In addition to being widely accepted, the EQ-i is also geared toward performance criteria. Therefore, it has been concluded that the EQ-i will be the most appropriate instrument for this research study.

CHAPTER 3: RESEARCH METHODOLOGY

The methodology used for the present study was broken into five detailed steps. However, before generating these five steps, the researcher had to establish which general type of methodology would be most appropriate for the study. This involved the consideration of three general approaches: case studies, existing surveys, and self-developed surveys. While considering the time frame of a Master's Thesis, and the general investigative nature of the study, the researcher decided to use an existing survey.

After choosing to use an existing survey as the general approach, the researcher completed this research study using the detailed methodology described in this section. The first step was to select the sample population. After selecting the sample population, (2) the researcher selected the appropriate instrumentation for collecting the desired data. After the instrument selection was made, (3) the researcher administered the chosen instrumentation to the sample population. Then, from unforeseen circumstances of the second and third steps, (4) the researcher revised the original nine objectives created at the beginning stages of this study. Finally, using the finalized objectives as guidelines, (5) the researcher performed statistical analyses on the collected data.

3.1 Sample Identification

The population of interest for this research study, as pointed out in the Introduction section, was members of General Contracting organizations that were involved with the construction operations of their organization. In order to gain a diverse and large sample size, the recruitment process focused on several companies as opposed to just one large company. This process began by attending a construction career fair held at the researcher's institution.

Due to the scope limitations discussed in the Introduction section of this study, the researcher only approached Mid-Atlantic, General Contracting companies at the career fair. These efforts produced contact with seventeen companies. The initial contacts served to "plant the seed" by explaining the purpose of the study and giving a brief description of the potential requirements and benefits of participation. All contacts were given a recruitment flyer summarizing this information. This flyer can be seen in Appendix A.

One week after the career fair, the researcher called the company representatives to discuss the specific requirements and benefits of participation. The researcher informed companies that the study would require a one-time, forty-five minute group administration for every fifteen employees that participate. The researcher also notified the companies that they would be required to pay the material costs of the surveys. In addition to the requirements, companies were also informed of the benefits that the organization, as well as its employees, would gain by participating. The participants would receive a introductory presentation of the concept of Emotional Intelligence, as well as feedback on their Emotional Intelligence profiles. In addition, the companies would be given the opportunity to requests group reports that would anonymously summarize the average Emotional Intelligence profile of its participating employees.

Based on the availability of personnel and timing, seven of the seventeen companies approached at the career fair were selected to participate in the present study. These seven companies are labeled A-G and are briefly described below. The branch offices of these selected companies were all located in the Mid-Atlantic region, in and around the cities of Baltimore, Philadelphia, and Washington, D.C. The companies varied in size. Four of the companies employed 1000+ people while the remaining three companies employed between 150 and 250 people.

Company A is a large, nation-wide company that employs well over 1000 employees. This company has completed various commercial, research and development, airport, etc. projects and for both public- and private-sector clients. This company self-performs minimal work.

Company B employs approximately 150 employees and operates mainly in the Washington D.C. metropolitan area. This company specializes in renovations and restorations, but also performs new construction. Company B performs projects for both public- and private-sector clients. This company does not provide self-perform work.

Company C employs approximately 220 employees and operates in the Mid-Atlantic region. This company specializes in multi-family residential, senior living and small commercial projects predominately for private-sector clients. Company C does not self-perform any of the construction.

Company D employs over 1000 employees and operates in the Mid-Atlantic region. This company is a heavy civil construction company that provides services for both private- and public-sector clients. Company D self-performs a large portion of their work.

Company E employs well over 1000 employees and has offices located throughout the nation. This company builds a diverse range of projects from small interior renovations to some of the most visible architectural landmarks in the country. These projects are completed for both private- and public-sector clients. Company E has the capability to self-perform many operations from special excavation to concrete work to interior finishes.

Company F employs over 1000 employees and operates mainly in the Mid-Atlantic and Northeast regions. This company is a civil and heavy industrial construction company that works in both the private- and public-sectors. Company F self-performs the majority of their work.

Company G employs approximately 160 employees and operates mainly in the Washington metropolitan area. This company's services are mainly provided for multi-family residential, senior living, healthcare, education and hotel projects for both private- and public-sector clients. Company G provides minimal self-perform work.

3.2 Data Collection

The researcher and the appointed representatives from each participating company coordinated the details of the administration sessions. The representatives and the researcher worked together to schedule a one-hour block of time for every fifteen participating employees. The two parties also agreed that the administration would need to take place in a conference room that was spacious enough for fifteen participants and easily accessible.

The administration at the agreed upon site involved several steps. The first step involved making sure that the room was quiet and closed off to outside disturbances. Once this was accomplished, the researcher conducted a ten-minute presentation. This presentation served to briefly introduce the Bar-On EQ-i to the participants, as well as the theory of emotional intelligence and the purpose of this research. The presentation also functioned as a technique to build rapport with the participants and to ensure them that the administration would be carried out in strict confidentiality. This assurance of confidentiality plays a critical role in securing accurate and honest data. The slides of this presentation can be seen in Appendix B.

After completing the presentation, the researcher provided all participants with a questionnaire packet. This questionnaire packet included four items; an Informed Consent Form (see Appendix C), an EQ-i item booklet (see Appendix D) and response sheet, and a Personal Information Sheet (PIS) (see Appendix E).

The Institutional Board for Research Involving Human Subjects, at the researcher's institution, required the distribution of an informed consent form. This form covered such issues as confidentiality and the benefits and risks of participation.

The EQ-i item booklet contained the questions for the EQ-i. The response sheet was where participants marked their responses to the questions inside the item booklet. The PIS was a one-page survey created by the researcher. The purpose of the PIS was to collect personal information from the participants that allowed the researcher to address the objectives of this study.

To ensure strict confidentiality, numerical codes identified participants instead of personal names. In addition, to prevent participants from making transcription and/or coding errors, the researcher coded the contents of the questionnaire packets prior to the administration session.

Once all participants received a questionnaire packet, the researcher described the informed consent form and asked participants to look over its contents. The researcher then explained, as stated by the informed consent form, that by voluntarily completing the questionnaire packet, they were actively providing agreement to the informed consent form. After all participants had a chance to read over the informed consent form and were free of any questions, the researcher instructed them to first complete the EQ-i booklet and then the PIS.

Participants were given an unlimited amount of time to complete these items. The average time to complete the entire packet was thirty-five minutes. During certain administrations, some participants asked the researcher questions pertaining to items within the EQ-i item booklet. The researcher consistently replied with, "please do the best you can" so that no responses would be biased or influenced by the researcher.

Once a participant finished the questionnaire packet, the researcher examined the response sheet and the PIS to make sure all items had been completed. If all items were completed properly, the participant was thanked for his or her time and informed that they would receive their results back within a month's time. The procedures of the administration process were the exact same for each administration of each company.

The completed EQ-i response sheets were later mailed to the testing company, Multi-Health Systems, Inc (MHS). MHS scored the sheets and tested them for response consistency, as well as positive and negative impression. MHS returned the scoring reports and the researcher entered the information into a spreadsheet. The responses from the PIS sheets were also entered into the same spreadsheet. To avoid human error in the data entry process, the researcher checked the spreadsheet three times with the original sources of data.

3.3 Instrumentation

3.3.1 Bar-On Emotional Quotient Inventory (EQ-I)

Description

As noted in the Review of Literature section of this study, the most current version of the Bar-On EQ-i was administered and scored to provide the researcher with data describing the emotional intelligence levels of the participants. The EQ-i is based on over 20 years of research by Dr. Reuven Bar-On and was the first test of emotional intelligence to be published by a psychological test publisher, Multi-Health Systems in Toronto. The EQ-i was developed on the foundation of Bar-On's EQ framework and has been tested on over 85,000 individuals.

The EQ-i is a self-report questionnaire that consisted of 133 items. The response format for these items was a five-point scale ranging from "very seldom or not true of me" to "very often or true of me." These items were used to provide scores for 21 EQ scales.

The EQ scales included a Total EQ scale, 5 composite scales and 2 to 5 subscales for each composite scale. These scales have been represented in Figure 3-1 and have been described in greater detail in Appendix F. The 5 composite scales included Intrapersonal, Interpersonal, Adaptability, Stress Management and General Mood. The Intrapersonal scale was comprised of Emotional Self-Awareness, Assertiveness, Self-Regard, Self-Actualization, and Independence subscales. The Interpersonal scale consisted of Empathy, Social Responsibility, and Interpersonal Relationship subscales. The Adaptability scale included Reality Testing, Flexibility and Problem Solving subscales. The Stress Management scale contained Stress Tolerance and Impulse Control subscales. Finally, the General Mood scale was comprised of Optimism and Happiness subscales.

In addition to the 21 EQ scales, there were also 4 scales that assessed the response validity of each participant. These four scales included the Omission Rate, Inconsistency Index, Positive Impression, and Negative Impression scales. If any participant scored too low on any one of these scales, the testing company clearly marked their results as "probably invalid" and the researcher discarded the data from the study.

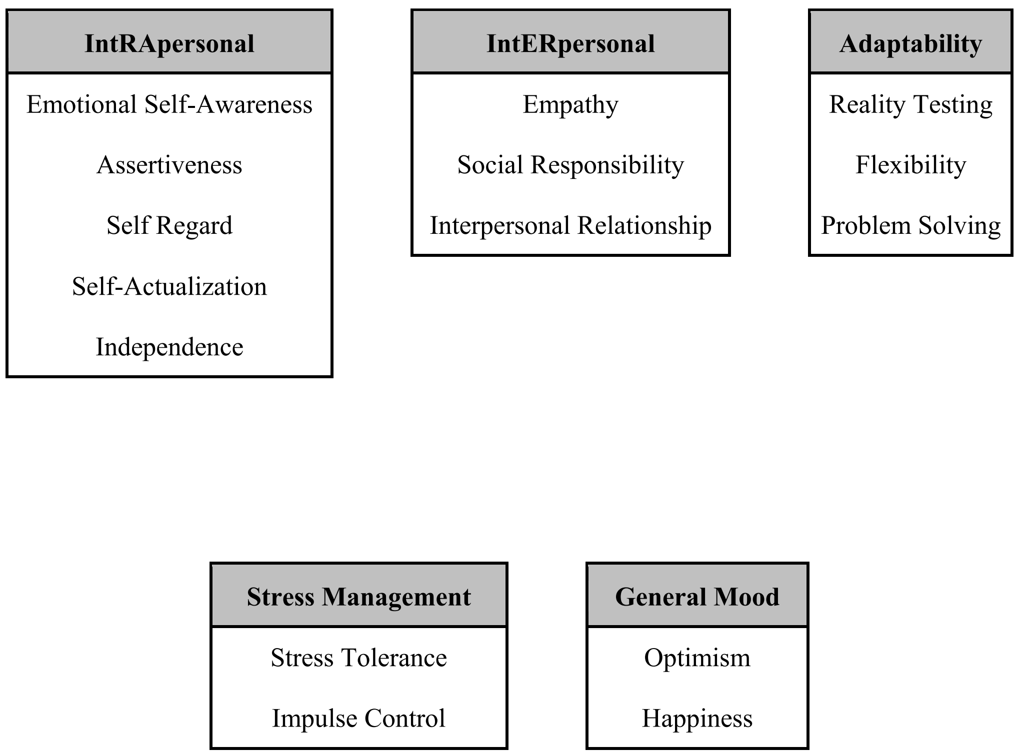

Figure 3-1 EQ-i Stucture

Reliability and Validity

Reliability and validity information for psychometric test, such as the Bar-On EQ-i, is very important. This information describes the overall quality of the test itself and its results. Fortunately, as part of the development of the EQ-i, numerous statistical analyses have been conducted. These analyses, which are ongoing, have clearly proven that the Bar-On EQ-i is a reliable and valid instrument (Bar-On 2002).

Reliability refers to how consistently an instrument measures what it is designed to measure. The EQ-i has been tested for reliability with two different types of studies. These two studies include tests for internal consistency and tests for retest reliability. After examining the results of these studies, it has been confirmed that the EQ-i demonstrates more than adequate reliability (Bar-On 2002).

The other measure used to assess the quality of the EQ-i is validity. Validity refers to how well an instrument measures what it is actually designed to measure. Nine types of validity studies have been carried out on the EQ-i. These nine types of studies include content, face, factor, construct, convergent, divergent, criterion-group, discriminant and predictive validity. The findings from these studies have demonstrated that the EQ-i is clearly a valid instrument (Bar-On 2002).

Bar-On EQ-i Options

The researcher was forced to make two decisions regarding administration options provided by the testing company for the Bar-On EQ-i (Multi-Health Systems, Inc.). The first decision involved choosing the type of administration to use. The EQ-i could have been administered by either using paper-pencil response sheets or by using computers for online assessment. To avoid any bias in the results that might occur by using two different types of administration, the researcher made the decision to use only one. The researcher decided to use the paper-pencil administration. The researcher made this decision to avoid the foreseen coordination problems that would arise by the need of many computers at one time.

The second option of the EQ-i that the researcher confronted concerned the testing company's norming process. The EQ-i allowed for responses to be normed based on either "Age/Gender Specific Norms" or "General Population Norms." To make this decision, the researcher determined it was important to consider the desire to compare and contrast the participants' scores with one another. In order to achieve these comparisons and contrasts, particpants' scores must be normed using the same exact population. Therefore, the researcher decided to have the scores normed using the "General Population Norms" option.

3.3.2 Personal Information Sheet (PIS)

After completing the EQ-i, participants responded to the questions asked by the Personal Information Sheet (PIS) (see Appendix E). The purpose of the PIS was to collect information that could be used in coordination with the EQ-i scores to address the questions provided by the objectives, as described in the Introduction section of this study. The researcher created a preliminary PIS, and later revised it with the assistance of a peer group.

The peer group that assisted the researcher in revising the PIS consisted of four graduate students and one associate professor. All participants of the peer group were from within the Construction Engineering and Management Graduate Program at the researcher's institution. The finalized PIS, as can be seen in Appendix E, consisted of 18 questions. The response format for these questions included a 7-point Likhert scale, multiple choice, and fill-in-the-blank.

3.4 Objectives Section Revision

At the initial stages of this study, nine specific questions were established to outline the Objectives of the research. These original nine questions were as follows:

1. How does the General Contracting sector as a whole measure on EQ?
2. Does age effect how employees measure on EQ?
3. Does job experience effect how employees measure on EQ?
4. Are there differences in EQ scores by position level?
5. Are there differences in EQ scores between Field and Office employees?
6. Are there differences in EQ scores between employees with DB experience and those without?
7. Are there differences in EQ scores between large-volume and small-volume General Contractors?
8. Are there differences in EQ perceptions between "self-evaluation" and "evaluation by others"?
9. How does the General Contracting sector perceive the EQ of other sectors within the A/E/C industry?

However, since the conception of the original set of objectives, there have occurred two sets of circumstances that have influenced the researcher to revise the nine original objective questions. The first revision occurred during the revision of the Personal Information Sheet (PIS). The second revision of the objectives occurred after the data was collected, but before any analysis was performed.

The first revision of the original objectives focused on Objective 6 concerning design build experience. During the revision of the PIS, the researcher, with the assistance of a peer group, came to the realization that the wording of the questions addressing design build experience was not appropriate. More specifically, the term "design build" was too objective and it was determined that it would most likely confuse the participants. The peer group decided to examine the intent of the Objective 6 to assist in the improvement of the design build questions. The main goal of this Objective 6 was to explore the idea that there was a relationship between participants' interactions with designers and their respective EQ levels. Therefore, the design build questions were revised as can be seen Appendix E. As a result of these revisions, the researcher decided it was appropriate to revise Objective 6 as well. The final version of Objective 6 can be seen below in the list of revised objectives.

In addition to the modification of Objective 6, two new objectives were created during the PIS revision. The researcher decided, since the EQ-i was a self-report test, it would be beneficial to explore whether or not the scores of certain EQ levels would have a relationship with how participants viewed themselves in the that area. Therefore, questions 1 and 2 of the PIS (see Appendix E) and Objectives 9 and 10 (as shown below) were created.

The second revision to the original nine objectives occurred after the data collection process was performed. This revision transpired from poor planning and organization of questions 7, 8 and 9 of the PIS. The researcher originally created these questions to address Objective 8 regarding "self-evaluation" and "evaluation by others." The researcher originally planned to compare participants' responses regarding "self" rating with the responses of "supervisor" and "subordinate" rating. However, the researcher could not clearly identify, nor link, subordinates and superiors as originally desired. Therefore, the researcher decided to eliminate this Objective 8.

In summary, one objective was modified (Objective 6), one objective was removed (originally Objective 8), and two objectives were added (now Objectives 9 and 10). The following, which is also located in the Objectives section of this report, is the final version of the 10 Objectives:

1. *GC EQ Summary*: How does the General Contracting sector as a whole measure on EQ?
2. *Age*: Does age effect how employees measure on EQ?
3. *Experience (Industry Type and Years)*: Does job experience effect how employees measure on EQ?
4. *Position Level*: Are there differences in EQ scores by position level?
5. *Field vs. Office Employee*: Are there differences in EQ scores between Field and Office employees?
6. *A/E Interaction*: Are there differences in EQ scores between employees with different Architect/Design Engineer interaction?
7. *Company Size*: Are there differences in EQ scores between large-volume and small-volume General Contractors?
8. *GC Perceptions*: How does the General Contracting sector perceive the EQ of other sectors within the A/E/C industry?
9. *Self-Perception of Empathy*: Does there exist a relationship between how employees, themselves, view their ability to perceive others' emotions and their EQ-I Empathy score?
10. *Self-Perception of Interpersonal Relationship*: Does there exist a relationship between how employees, themselves, view their ability to interact with others and their EQ-I Interpersonal Relationship score?

3.5 Data Analysis

The data analysis for the present study served to address the objectives described in the Introduction section of this report. This procedure involved comparing the responses from the Personal Information Sheet (PIS) with the results of the Bar-On EQ-i. The analysis was performed using *Analyse-It*, a software program provided by Analyse-it Software, Ltd. This program is user-friendly and has been described as "very suited for service in statistical courses, particularly those in the clinical sciences" (Newell 1999).

The formation of the data analysis procedure included the assistance of several specialists. The researcher first proposed a "rough draft" of how each objective would be analyzed based on personal statistical knowledge and other statistical references. The researcher then met with a team from the Statistics Consulting Center at his institution to ensure that the developed procedure was appropriate. Based on the recommendations from this consulting team, and the supporting references, the researcher modified the original procedure.

In addition, to go above and beyond, the researcher met with a Doctorate of Philosophy Student from the Psychology Department at the researcher's institution. The purpose of this meeting was to assure that the researcher's modified procedure was appropriate for analyzing data supplied by a psychometric test. The doctorate student confirmed that this procedure was adequate. The rest of this section will describe the finalized analysis procedure.

Before performing any analyses, it was important to select a minimum significance level, $\underline{p}$, at which an analysis would be considered significant. The researcher felt it was important to consider that the appropriate significance level depends on the strength of evidence desired by the researcher (Yandell 1997). Although $\underline{p} = 0.05 = 5\%$ is very often the default for significance level (Langley 1971), researchers conducting exploratory studies may be quite content with $\underline{p} = 0.10 = 10\%$. Because this research study is an exploratory study, the researcher decided to use the following scale (Yandell 1997):

$\underline{p} \leq 0.10$	'mild evidence'
$\underline{p} \leq 0.05$	'modest evidence'
$\underline{p} \leq 0.01$	'strong evidence'

Table 3-1 summarizes the exact analysis used for each objective. To address Objective 1 and 8, the researcher examined the descriptive statistics. This included the means, standard deviations, and the standard errors of the participants' scores and/or responses. For examining the objectives concerning relationships between continuous or ordinal variables and EQ levels, the researcher used the Spearman Correlation Test. Objectives 2, 3b, 6, 9 and 10 were analyzed in this manner.

Table 3-1 Summary of Data Analyses

Objective	Analysis
Objective 1	
GC EQ Summary	Descriptive Statistics
Objective 2	
Age	Spearman Correlation
Objective 3	
a. Industry Type Experience	ANOVA; Fisher LSD
b. Years Experience	Spearman Correlation
Objective 4	
Position Level	ANOVA; Fisher LSD
Objective 5	
Field vs. Office Employee	ANOVA
Objective 6	
A/E Interaction	Spearman Correlation
Objective 7	
Company Size	ANOVA
Objective 8	
GC Perceptions	Descriptive Statistics
Objective 9	
Self-Perception of Empathy	Spearman Correlation
Objective 10	
Self-Perception of Interpersonal Relationship	Spearman Correlation

To address the remaining objectives concerning differences in EQ levels among different groups, the researcher performed up to two steps. The first step involved performing a one-way analysis of variance (ANOVA). This analysis tested whether or not there existed any significant differences between the means of different groups. However, if there were more than two groups, this test did not indicate which groups were significantly different from one another. Therefore, when more than two groups were being compared, it was necessary to run a post hoc analysis. The post hoc analyses provided pairwise comparisons.

However, the post hoc analysis was only performed on groups comparisons that previously achieved a significance level of at least $p = 0.10$ for the preliminary ANOVA test. Because this research study was an exploratory study, the Fisher LSD method was chosen for the post hoc analysis. The LSD method was an adequate, yet liberal post hoc test. Using this method helped avoid discarding possible meaningful relationships that might have existed, but would not have been demonstrated by a more conservative test (Yandell 1997). However, because of the liberalness of the LSD method, the researcher decided to restrict the significance level to $p = 0.05$.

In addition, post hoc analyses were also carried out on the group comparisons that did not meet the $p = 0.10$ significance level for the initial ANOVA test. These tests were performed to assist the guidance of future research, but were not included in the Results or Discussion sections of this report. However, these results can be found in Appendix G.

CHAPTER 4: RESULTS

Sample Population

A total of 115 employees participated from the 7 selected companies. Of the 115 employees that participated, 104 met the study's sample criteria and adequately completed the survey. Of the 11 responses that were discarded 5 were due to mismatch in position, and 6 were due to test scores identified as "probably invalid" by the testing company. The demographic characteristics of the sample are provided in Table 4-1.

The sample yielded 88% male participants (n=92) and 12% female participants (n=12). The age of the participants varied from 21 years to 63 years, with the average being 36.2. The distribution of highest level of education completed was 13.5% High School (n=14), 7.7% Jr./Community College (n=9), 73.1% University (n=76), and 5.8% Graduate School (n=6).

The range of total construction experience was 0.5 years to 45 years, with the average being 15.1 years. The range of construction field experience was 0 years to 34 years, with the average being 8.0 years. The range of construction office experience was 0 years to 40, with the average being 8.2 years. Ten and six tenths percent (10.6%) of the sample population gained the majority of their experience from Residential construction (n=11), 51.9% from General Building construction (n=54), and 37.5% from Heavy construction (n=39).

The distribution of position level was 6.7% administrative assistants (n=7), 12.5% field engineers (n=13), 19.2% office engineers (n=20), 5.8% project engineers (n=6), 12.5% estimators/schedulers (n=13), 20.2% project managers (n=21), 12.5% superintendents (n=13), and 10.6% executives (n=11). This distribution results in 25% field employees (n=26) and 75% office employees (n=78).

Objective 1: GC EQ Summary

As mentioned in the Research Methodology section of this study, scores for the various EQ scales have been normalized to facilitate comparisons among the participants. These normalized scores are based on the "General Population" where the general population will almost always, about 99.9% of the time, score between 55 and 145 points (+/- 3 standard deviations from the mean). Extreme scores are a rare occurrence, while most respondents will score around 100 points. A score of 100 points represents exactly

Table 4-1 Sample Summary

	N	Percentage	Range	Average
Gender				
Male	92	88.0%		
Female	12	11.0%		
Age			21 to 63	36.2
Education				
High School	14	13.5%		
Jr./Community College	8	7.7%		
University	76	73.1%		
Graduate School	6	5.8%		
Years of Experience				
Field			0 to 34	8.0
Office			0 to 40	8.2
Field + Office			0.5 to 45	15.1
Type of Experience				
Residential	11	10.6%		
General Building	54	51.9%		
Heavy	39	37.5%		
Position Level				
Administrative Assistant	7	6.7%		
Field Engineer	13	12.5%		
Office Engineer	20	19.2%		
Project Engineer	6	5.8%		
Estimator/Scheduler	13	12.5%		
Project Manager	21	20.2%		
Superintendent	13	12.5%		
Executive	11	10.6%		
Position Location				
Field	26	25.0%		
Office	78	75.0%		

average, relative to the norms of the general population (Bar-On 2002). Table 4-2, from Bar-On's Technical Manual, provides a summary of the guidelines that are used for interpreting the scores of the EQ-i scales.

Table 4-2 Interpretive Guidelines for Bar-On EQ-I Scale Scores

Score	Interpretive Guidelines
130 +	Markedly High - atypically well developed emotional capacity
120 - 129	Very High - extremely well developed emotional capacity
110 - 119	High - well developed emotional capacity
90 - 109	Average - adequate emotional capacity
80 - 89	Low - under-developed emotional capacity, requiring improvement
70 - 79	Very Low - extremely under-developed emotional capacity, requiring improvement
Under 70	Markedly Low - atypically impaired emotional capacity, requiring improvement

The first objective of this research study concentrates on the EQ levels of the General Contracting sector as a whole. To address this question, the means, standard deviations (SD), and the standard errors ($SE = SD / \sqrt{n}$) for all of the Bar-On EQ-i scales are presented in Table 4-3. These descriptive statistics represent the 104-participant sample.

Objective 2: Age

The second objective addresses whether or not age has an effect on how participants score on the various EQ scales. To investigate this question, age is correlated with each EQ scale. These results are reported in Table 4-4. They indicate that age has a significant effect on how participants score on the Social Responsibility subscale ($\underline{r} = 0.229$, $\underline{p} < 0.05$). It is also suggested that age has a possible effect on how participants score on the Flexibility subscale ($\underline{r} = -0.168$, $\underline{p} < 0.10$).

Table 4-3 Descriptive Statistics for BarOn EQ-I Scales of Sample N=104

Scale [#]	Gen'l Pop. Mean	Mean	SD	SE
Total EQ	100.0	100.3	11.63	1.14
IntRApersonal	100.0	101.6	12.62	1.24
Self-Regard	100.0	101.7	12.14	1.19
Self-Awareness	100.0	98.8	13.82	1.36
Assertiveness	100.0	101.3	14.29	1.40
Independence	100.0	104.2	12.10	1.19
Self-Actualization	100.0	100.5	13.59	1.33
IntERpersonal	100.0	93.9	13.11	1.29
Empathy	100.0	93.4	14.12	1.38
Social Responsibility	100.0	94.5	13.85	1.36
Interpersonal Relationship	100.0	95.4	14.63	1.43
Stress Management	100.0	101.0	11.56	1.13
Stress Tolerance	100.0	103.6	12.51	1.23
Impulse Control	100.0	98.2	13.19	1.29
Adaptability	100.0	102.8	11.57	1.13
Reality Testing	100.0	103.4	11.72	1.15
Flexibility	100.0	100.1	14.31	1.40
Problem Solving	100.0	103.5	11.68	1.14
General Mood	100.0	101.6	11.19	1.10
Optimism	100.0	103.6	9.87	0.97
Happiness	100.0	100.1	13.57	1.33

[#] See Appendix F for detailed descriptions

Table 4-4 Correlation of Participants' Age and EQ Scales (N=104)

Scales #	Significance (2-tailed)	Spearman Correlation
Total EQ	0.983	-0.002
IntRApersonal	0.806	-0.024
Self-Regard	0.468	-0.072
Self-Awareness	0.731	-0.034
Assertiveness	0.835	0.021
Independence	0.332	0.096
Self-Actualization	0.371	-0.089
IntERpersonal	0.480	0.070
Empathy	**0.098**	**0.163 ***
Social Responsibility	**0.020**	**0.229 ****
Interpersonal Relationship	0.235	-0.117
Stress Management	0.307	0.101
Stress Tolerance	0.503	0.066
Impulse Control	0.773	0.029
Adaptability	0.721	-0.035
Reality Testing	0.676	0.041
Flexibility	**0.088**	**-0.168 ***
Problem Solving	0.514	0.065
General Mood	0.284	-0.106
Optimism	0.719	-0.036
Happiness	0.229	-0.119

See Appendix F for detailed descriptions

* Correlation is significant at the 0.10 level

** Correlation is signficant at the 0.05 level

Objective 3: Experience (Industry Type and Years)

The third objective explores the effect of job experience on how participants score on the EQ scales. This objective is broken into four aspects: type of experience, years of office experience, years of field experience, and total construction experience (field and office experience combined).

The first part of this objective investigates the effect of the type of industry from which the participant has gained the majority of his or her experience. After performing an ANOVA test on the EQ means of participants with majority Residential, General Building, and Heavy industry experience, there are no significant differences found. Because there are no significant differences and the corresponding results table is extensive, it has been placed as part of Appendix G. Additionally, because the ANOVA test has not produced any differences at the required significance level, no post hoc analysis results will be included in this Results section. However, the results of the extra post hoc analyses can be found as part of Appendix G.

The second, third and fourth parts of the job experience objective explore the possibility of a relationship between EQ scores and years of field, office and combined field and office experience, respectively. The correlations reveal several significant relationships, as displayed in Table 4-5.

For field experience, it has been found that at the $\underline{p} = 0.01$ significance level, participants with greater field experience score lower on the Interpersonal Relationship subscale ($\underline{r} = -0.339$). At the $\underline{p} = 0.05$ level, participants with greater field experience score lower on the Self-Awareness subscale ($\underline{r} = -0.234$). Additionally, at the $\underline{p} = 0.10$ level, participants that respond with greater field experience score lower on the Interpersonal ($\underline{r} = -0.184$) and General Mood composite scales ($\underline{r} = -0.168$), as well as the Flexibility subscale ($r = -0.168$). These participants with greater field experience also scored higher on the Independence subscale ($r = 0.182$) at the $p = 0.10$ significance level.

In regards to office experience, the results indicate that at the $p = 0.05$ significance level, participants who report higher amounts of office experience score higher on the Empathy ($r = 0.228$) and Social Responsibility subscales ($r = 0.206$). There are no additional relationships suggested at the $p = 0.10$ level.

Table 4-5 Correlation of Years of Experience and EQ Scales (N=104)

Scales #	Field Experience		Office Experience		Field and Office	
	p	r	p	r	p	r
Total EQ	0.304	-0.102	0.318	0.099	0.806	-0.024
IntRApersonal	0.552	-0.059	0.564	0.057	0.951	-0.006
Self-Regard	0.444	-0.076	0.653	-0.035	0.389	-0.085
Self-Awareness	**0.017**	**-0.234 ****	0.552	0.059	0.267	-0.110
Assertiveness	0.768	0.029	0.107	0.159	0.332	0.096
Independence	**0.065**	**0.182 ***	0.276	0.108	**0.075**	**0.176 ***
Self-Actualization	0.659	-0.044	0.647	-0.046	0.559	-0.058
IntERpersonal	**0.062**	**-0.184 ***	0.130	0.149	0.801	-0.006
Empathy	**0.515**	**-0.065**	**0.020**	**0.228 ***	0.315	0.099
Social Responsibility	**0.943**	**0.007**	**0.030**	**0.206 ***	0.120	0.153
Interpersonal Relationship	**0.0004**	**-0.339 *****	0.8453	0.000	**0.0428**	**-0.199 ****
Stress Management	0.977	-0.003	0.227	0.119	0.628	0.048
Stress Tolerance	0.871	-0.016	0.634	0.047	0.811	0.024
Impulse Control	0.671	-0.042	0.355	0.091	0.892	-0.013
Adaptability	0.469	-0.072	0.634	0.047	0.655	-0.044
Reality Testing	0.594	-0.053	0.249	0.114	0.861	0.017
Flexibility	**0.087**	**-0.168 ***	0.668	-0.043	**0.067**	**-0.180 ***
Problem Solving	0.127	0.151	0.923	0.010	0.265	0.110
General Mood	**0.088**	**-0.168 ***	0.924	-0.009	0.186	-0.131
Optimism	0.707	-0.037	0.804	0.025	0.841	-0.020
Happiness	**0.058**	**-0.187 ***	0.753	-0.078	0.119	-0.154

See Appendix F for detailed descriptions
* Correlation is significant at the 0.10 level
** Correlation is signficant at the 0.05 level
*** Correlation is significant at the 0.01 level

For combined field and office experience, the results indicate that at the $p = 0.05$ significance level, the number of years of combined field and office experience is negatively related to the scores of the Interpersonal Relationship subscale ($r = -0.199$). Additionally, at the $p = 0.10$ significance level, years of total construction experience share a positive relationship with the scores of the Independence subscale ($r = 0.176$) and a negative relationship with the scores of the Flexibility subscale ($r = -0.180$).

Objective 4: Position Level

The fourth objective explores the existence of differences in EQ scores between position levels. The table of results of this objective are located as part of Appendix G. This table provides the results of an ANOVA of the EQ means of the 8 different position levels: Administrative Assistant (N=7), Field Engineer (N=13), Office Engineer (N=20), Project Engineer (N=6), Estimator (N=13), Project Manager (N=21), Superintendent (N=13), and Executive (N=11). For the Interpersonal composite scale, the results suggest that significant differences exist between the means of the different position levels at the $p = 0.01$ significance level. For the Interpersonal Relationship scale, there emerge significant differences between the means of the different position levels at the $p = 0.05$ significance level. Additionally, for the Empathy scale, the ANOVA test suggests that there are significant differences between the means of the different position levels at the $p = 0.10$ significance level.

For each of the three scales that exhibited significant differences according to the ANOVA test, post hoc analyses have been performed to provide pairwise comparisons. The results of these comparisons are displayed in Table 4-6 for the Interpersonal Composite scale, Table 4-7 for the Interpersonal Relationship subscale, and Table 4-8 for the Empathy subscale. These tables show the differences in means between the different position levels. The differences in means that met the $p = 0.05$ level are highlighted.

Objective 5: Field vs. Office Employee

The fifth objective examines the possibility of differences between Field and Office employees. After conducting an ANOVA test on these two groups, no significant differences are suggested, not even at the $p = 0.10$ significance level. Because there are no significant differences and the corresponding results table is extensive, the results have been placed as part of Appendix G.

Table 4-6 Pairwise Comparisons of the Interpersonal Composite Scale Based on 8 Position Levels

	AA	FE	OE	PE	Est.	PM	Super	Exec.
Admin. Asst.	0.0							
Field Engr.	10.7	0.0						
Office Engr.	**16.9 ***	6.3	0.0					
Project Engr.	8.8	-1.9	-8.1	0.0				
Estimator	**13.1 ***	2.4	-3.9	4.3	0.0			
Project Mgr.	**18.0 ***	7.4	1.1	9.2	5.0	0.0		
Superintendent	**21.8 ***	**11.2 ***	4.9	**13.0 ***	8.8	3.8	0.0	
Executive	10.7	0.0	-6.3	1.9	-2.4	-7.4	**-11.1 ***	0.0

* $p < 0.05$ level of significance

Table 4-7 Pairwise Comparisons of the Interpersonal Relationship Subscale Based on 8 Position Levels

	AA	FE	OE	PE	Est.	PM	Super	Exec.
Admin. Asst.	0.0							
Field Engr.	9.5	0.0						
Office Engr.	**13.6 ***	4.1	0.0					
Project Engr.	10.1	0.7	-3.5	0.0				
Estimator	**15.6 ***	6.2	2.0	5.5	0.0			
Project Mgr.	**19.5 ***	**10.0 ***	5.9	9.3	3.9	0.0		
Superintendent	**24.0 ***	**14.5 ***	**10.4 ***	**13.8 ***	8.4	4.5	0.0	
Executive	**14.2 ***	4.8	0.6	4.1	-1.4	-5.2	-9.8	0.0

* $p < 0.05$ level of significance

Table 4-8 Pairwise Comparisons of the Empathy Subscale Based on 8 Position Levels

	AA	FE	OE	PE	Est.	PM	Super	Exec.
Admin. Asst.	0.0							
Field Engr.	**10.0 ***	0.0						
Office Engr.	16.7	6.7	0.0					
Project Engr.	11.3	1.3	-5.3	0.0				
Estimator	11.5	1.5	-5.1	0.2	0.0			
Project Mgr.	**15.8 ***	5.8	-0.9	4.4	4.2	0.0		
Superintendent	**18.2 ***	8.2	1.5	6.8	6.6	2.4	0.0	
Executive	5.9	-4.1	**-10.7 ***	-5.4	-5.6	-9.9	**-12.2 ***	0.0

* $p < 0.05$ level of significance

Objective 6: A/E Interaction

The sixth objective explores the impact of Architect/Design Engineer interaction on the EQ levels of the participants. This objective consists of two parts. The first part examines how the *frequency* of interactions with an Architect/Design Engineer affects the EQ scores of participants. The second part examines the effect of the *quality* of participants' interaction with the Architect/Design Engineer on their respective EQ scores.

Table 4-9 provides results of a correlation test between the frequency aspect of Architect/Design Engineer interaction and EQ scores. At the $\underline{p} = 0.05$ significance level, there is a negative relationship between the frequency of interaction with an Architect/ Design Engineer and the scores on the Stress Management composite scale ($\underline{r} = -0.227$). Additionally, at the $\underline{p} = 0.10$ level, the results indicate a positive relationship between the interaction frequency and the Flexibility subscale ($\underline{r} = 0.514$) and a negative relationship with the Interpersonal composite scale ($\underline{r} = -0.165$) and the Impulse Control subscale ($\underline{r} = -0.192$).

There are no significant relationships suggested by the correlation test between the quality aspect of the Architect/Design Engineer interaction and the EQ scores. These results can be found as part of Appendix G.

Objective 7: Company Size

The seventh objective relates to the differences in EQ levels between large-volume and small-volume General Contractors. This variable is based on the number of people employed by a company. Table 4-10 displays the results the ANOVA performed on the EQ scores of these two groups. At the $p = 0.01$ significance level, the results indicate that there are significant differences in the means between the different company sizes for the Empathy subscale (difference = 9.8). At the $p = 0.05$ level, there are significant differences between the two groups for the Interpersonal composite scale (difference = 7.5) and the Self-Awareness (difference = 7.9) and Interpersonal Relationship subscales (difference = 7.3).

Table 4-9 Correlation of Frequency of Interaction with Architect/Design Engineer and EQ Scales (N=96)

Scales #	Significance (2-tailed)	Spearman Correlation
Total EQ	0.273	-0.109
IntRApersonal	0.968	-0.004
Self-Regard	0.630	-0.048
Self-Awareness	0.130	-0.149
Assertiveness	0.721	0.035
Independence	0.374	0.088
Self-Actualization	0.741	0.033
IntERpersonal	**0.095**	**-0.165 ***
Empathy	0.365	-0.090
Social Responsibility	0.590	-0.053
Interpersonal Relationship	0.086	-0.169
Stress Management	**0.020**	**-0.227 ****
Stress Tolerance	0.188	-0.130
Impulse Control	**0.051**	**-0.192 ***
Adaptability	0.555	-0.059
Reality Testing	0.571	-0.056
Flexibility	**-0.065**	**0.514 ***
Problem Solving	0.596	0.053
General Mood	0.601	-0.052
Optimism	0.859	0.018
Happiness	0.308	-0.101

See Appendix F for detailed descriptions

* Correlation is significant at the 0.10 level

** Correlation is signficant at the 0.05 level

Table 4-10 ANOVA of Company Size and EQ Scales (N=104)

Scales[#]			N	Mean	SD	F	p
Total EQ						1.95	0.165
		150-250 Employees	22	99.5	11.86		
		1000+ Employees	82	103.4	10.39		
IntRApersonal						1.21	0.275
		150-250 Employees	22	100.9	12.58		
		1000+ Employees	82	104.2	12.72		
	Self-Regard					0.12	0.730
		150-250 Employees	22	101.5	12.21		
		1000+ Employees	82	102.5	12.14		
	Self-Awareness					5.99	0.016 **
		150-250 Employees	22	97.2	13.40		
		1000+ Employees	82	105.1	13.86		
	Assertiveness					2.18	0.143
		150-250 Employees	22	100.2	13.97		
		1000+ Employees	82	105.2	15.11		
	Independence					0.00	0.977
		150-250 Employees	22	104.2	11.76		
		1000+ Employees	82	104.1	13.61		
	Self-Actualization					0.16	0.686
		150-250 Employees	22	100.8	13.90		
		1000+ Employees	82	99.5	12.59		
IntERpersonal						5.96	0.016 **
		150-250 Employees	22	92.3	11.97		
		1000+ Employees	82	99.8	15.59		
	Empathy					8.97	0.003 ***
		150-250 Employees	22	91.3	13.42		
		1000+ Employees	82	101.1	14.30		
	Social Responsibility					1.06	0.305
		150-250 Employees	22	93.8	12.64		
		1000+ Employees	82	97.2	17.76		
	Interpersonal Relationship					4.47	0.037 **
		150-250 Employees	22	93.8	13.70		
		1000+ Employees	82	101.1	16.79		
Stress Management						0.08	0.779
		150-250 Employees	22	100.8	11.91		
		1000+ Employees	82	101.6	10.37		
	Stress Tolerance					0.19	0.665
		150-250 Employees	22	103.3	12.52		
		1000+ Employees	82	104.6	12.68		
	Impulse Control					0.04	0.838
		150-250 Employees	22	98.1	13.22		
		1000+ Employees	82	98.7	13.36		
Adaptability						0.91	0.342
		150-250 Employees	22	102.3	11.80		
		1000+ Employees	82	104.9	10.67		
	Reality Testing					3.74	0.056 *
		150-250 Employees	22	102.2	11.65		
		1000+ Employees	82	107.6	11.26		
	Flexibility					0.18	0.670
		150-250 Employees	22	100.4	15.08		
		1000+ Employees	82	99.0	11.18		
	Problem Solving					0.74	0.392
		150-250 Employees	22	103.0	10.92		
		1000+ Employees	82	105.4	14.26		
General Mood						0.43	0.512
		150-250 Employees	22	101.2	11.67		
		1000+ Employees	82	103.0	9.26		
	Optimism					0.18	0.669
		150-250 Employees	22	103.4	10.20		
		1000+ Employees	82	104.4	8.70		
	Happiness					0.31	0.578
		150-250 Employees	22	99.7	13.99		
		1000+ Employees	82	101.5	12.08		

[#] See Appendix F for detailed descriptions

* Correlation is significant at the 0.10 level

** Correlation is significant at the 0.05 level

*** Correlation is significant at the 0.01 level

Objective 8: GC Perceptions

The eighth objective explores what perceptions members of the General Contracting sector have of the other sectors within the A/E/C industry regarding emotional intelligence. Table 4-11 provides a summary of how participants rate the EQ of the different sectors of the A/E/C industry on a scale of 1 (extremely low EQ) to 7 (extremely high EQ). The participants rate their own sector, the General Contracting sector, as the highest with a mean score of 4.2. The next highest is the Architect/Engineering Sector with a mean score of 3.9, followed closely by the Owner sector with a mean score of 3.8. The participants rate the Subcontracting sector as the lowest with a mean score of 3.6.

Table 4-11 Descriptive Statistics of A/E/C Industry EQ Perspectives

(Scale: 1 = lowest to 7 = highest)

Sector	N	Mean	SD	SE
General Contractor EQ Rating	103	4.2	1.32	0.13
Architect/Engineer EQ Rating	102	3.9	1.35	0.13
Subcontractor EQ Rating	102	3.6	1.34	0.13
Owner EQ Rating	102	3.8	1.24	0.12

Objectives 9 and 10: Self-Perception of (9)Empathy and (10)Interpersonal Relationship

The ninth and tenth objectives investigate whether or not the manner in which participants view themselves in certain emotional intelligence areas share similarities with how they score in those respective areas according to the EQ-i. The first of these questions deals with perceptions of others' emotions, which corresponds with the EQ-i Empathy subscale. The results of a correlation test suggest that there exist a significant negative relationship ($\underline{r}$ = -0.30) at the $\underline{p}$ = 0.01 level, as seen in Figure 4-1.
The second question is in regards to how participants view their ability to interact with others. This self-perception corresponds with the EQ-i Interpersonal Relationship

subscale. After performing a correlation test for these two variables, the results indicate that there exist a significant, negative relationship ($r = -0.54$) at the $p = 0.01$ level, as displayed by Figure 4-2.

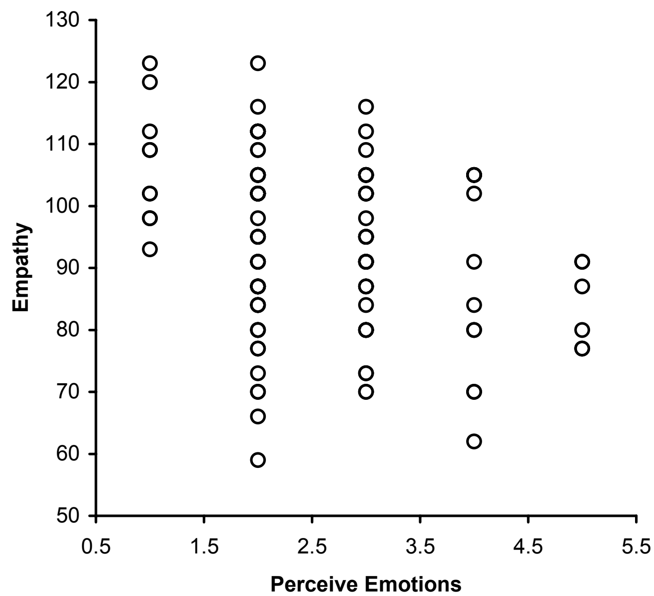

Figure 4-1 Self-Perception Empathy vs. EQ-i Empathy (N=103)

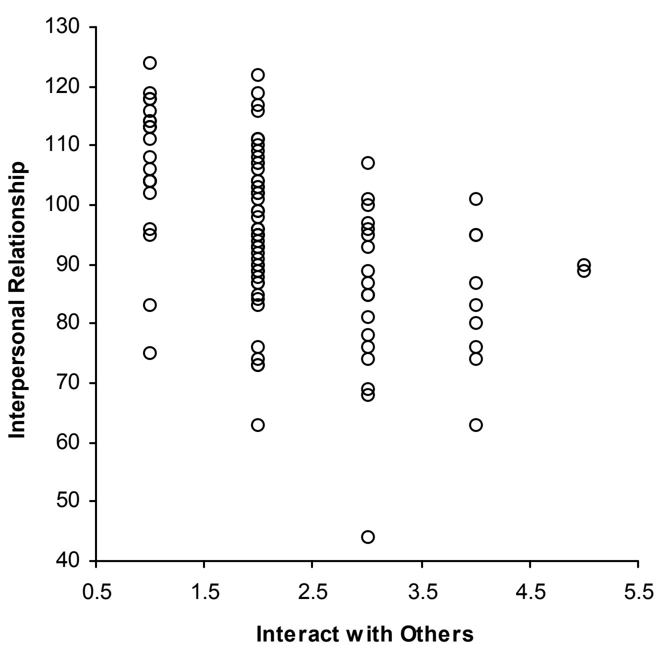

Fig 4-2 Self-Perceived Interpersonal Relationship Abilities vs. EQ-i Interpersonal Relationship (N=103)

CHAPTER 5: DISCUSSION

The present research study has addressed the ten specific objectives established in the Introduction section. This work contributes greatly to the growing body of research that focuses on the social factors of the A/E/C industry. The present study provides an initial understanding of the emotional intelligence levels of members of the General Contracting sector. In addition, this study has provided an exploratory investigation of several factors that may influence these levels.

This chapter discusses the interpretations and limitations of the results of this study, as well as direction for future research. For all interpretations of the Bar-On EQ-i scores, the researcher has relied on the Bar-On EQ-i Technical Manual provided by Multi-Health Systems.

5.1 Interpretations

Objective 1: GC EQ Summary

The first objective of the study intends to identify the different EQ levels of the General Contracting sector as a whole. All participants of the present study are considered to represent the General Contracting sector. According to the EQ-i Technical Manual, the results of this EQ-i study indicate typical healthy functioning of the General Contracting sector for the majority of the scales and subscales.

The scale that has received the highest score is the Independence scale. This indicates that General Contracting employees have a good balance between thinking and acting independently, and considering the advice of others when making decisions. It is possible that these strong skills are a result of the environment in which General Contracting employees work. Everyday, General Contracting employees are faced with decisions that must be made and that impact the success of a project. Therefore, it is important for them to have the confidence to make a decision autonomously, as well as possess the openness to consider suggestions from other sources.

Although General Contracting employees score high on the Independence scale, they score notably low on the Interpersonal composite scale, as well as its subscales: Empathy, Social Responsibility, and Interpersonal Relationship. The results of these

Interpersonal scales indicate that General Contracting employees possess below average interpersonal skills and functioning. This suggests that General Contracting employees may sometimes have trouble staying aware of and appreciating the feelings of others, as well as cooperating, contributing, and being constructive within their social group. In addition, they may also foresee problems when it comes to establishing and maintaining mutually satisfying relationships.

It is important to note, as mentioned in the Review of Literature section of this study, that one of the biggest problems of the A/E/C industry is interpersonal skills. The results of this study support this argument. It is imperative that General Contracting organizations take action to address this dilemma. This will be discussed in greater detail later in this section as part of the future recommendations.

Objective 2: Age

The second objective explores the possibility of age affecting how General Contracting employees score on the EQ scales. It would appear logical that as a person grows older and more mature, so does his or her emotional intelligence. However, the results of this study indicate that age only had a significant effect on one EQ scale: the Social Responsibility subscale. One potential explanation for not having an increase in the majority of the EQ scales could be that there is a generation difference. Many General Contracting employees are now receiving better training before entering the industry through more social-oriented education programs. It is also a possibility that General Contracting employees are now receiving better and/or more training at the start of their careers, through company-initiated training programs, than older General Contracting employees experienced at the start of their careers. Either case would allow younger General Contracting employees to reach the EQ levels of the older ones at a much faster pace.

The one EQ level that is affected by age is Social Responsibility. The older a General Contracting employee is, the higher his or her Social Responsibility level is. This positive effect suggests that the older a General Contracting employee is, the more he or she perceives themselves as being understanding and responsible. Older General Contracting employees, overall, are more likely to be respectable contributors to the "community at large" (society, the company, the project team, etc.). One possible explanation for this is that younger General Contracting employees might not realize the contributions and efforts supplied by communities. Many times, it is not until younger people depart their college safehavens that they start to see the benefits created by a community and realize it is important to give back to this community.

In addition to the significant relationship between age and Social Responsibility, the results also revealed a slight possibility of a negative relationship between age and Flexibility. This suggests that there is a possibility that as a General Contracting employees grow older, they become less able to adjust their emotions, thoughts and behavior in dynamic environments. This could be a critical issue as the A/E/C industry moves toward greater collaboration. However, because of the low significance level of these results, future research needs to be conducted to support or challenge this finding.

Objective 3: Experience (Industry Type and Years)

The third objective investigates how job experience might affect EQ levels. The first part of this objective involves exploring how the type of industry in which a General Contracting employee gains the majority of his or her experience affects EQ levels. The different industry types of experience included Residential, General Building and Heavy Construction. After completing this study, there is no significant evidence found that would suggest a relationship between EQ levels and the type of industry in which a General Contracting employee gains the majority of his or her experience.

The job experience objective also focused on how much field, office, and combined field and office experience General Contracting employees possess. Results of the field experience inquiry suggest two surprising relationships. General Contracting employees who possess more years of field experience also possess lower levels of Self-Awareness and Interpersonal Relationship skills. The lower Self-Awareness level means that more field-experienced General Contracting employees might sometimes have trouble recognizing what they are feeling and comprehending why they feel that way. One possible explanation for this is that the tough rigors of field experience distract a General Contracting employee from taking time to reflect on his or her own thoughts.

Findings of a negative relationship between field experience and Interpersonal Relationship skills suggests that General Contracting employees with greater field experience may sometimes have difficulties interacting and collaborating effectively with others. Similar to the explanation given for the Self-Awareness relationship, this might be due to the physical demand of the field environment. This type of environment obstructs the exchanging of feelings and ideas.

The two negative effects of field experience are very interesting and surprising. Future research should investigate the cause of these relationships. This area of future research should also explore ways to overcome the negative effects of field experience. This is especially important for Interpersonal skills. As previously mentioned, the ability to interact and collaborate is an important factor in achieving success on a project in the A/E/C industry. Therefore, this future research has great potential and could significantly benefit the A/E/C industry.

The results of the office experience portion of this study indicate significant and positive relationships between years of office experience and Empathy and Social Responsibility skills. This suggests that General Contracting employees who have greater office experience usually understand well what others are thinking and feeling. They are also more likely to be contributable to the "community at large." However, these relationships should be approached with caution because of their similarity to the effect of age. Future research should be conducted to seek out which of these factors, if not both, is the driving force of the higher levels of Empathy and Social Responsibility.

The results examining the effects of combined office and field experience indicate one significant relationship. General Contracting employees with a greater combined field and office experience appear to have lower levels of Interpersonal Relationship skills. However, these results should also be considered in a cautious manner. Because greater years of field experience affect Interpersonal Relationship skills as well, future research needs to be conducted to address the possibility that field experience is also driving the total experience effect.

Objective 4: Position Level

The fourth objective considers differences that may exist between different position levels in regards to EQ levels. The results of this study indicate that there exist significant differences in mean scores of the Interpersonal scale, as well as one of its subscales, the Interpersonal Relationship scale. Additionally, the results also suggest there is a possibility of differences in the mean scores of the Empathy subscale. However, because this assumption lacks overwhelming evidence, further research is suggested.

For the Interpersonal composite scale, the results significantly indicate that, on average, the Administrative Assistants score higher than the Office Engineers, Estimators, Project Managers and Superintendents. Future research should be conducted to investigate whether or not gender skews these differences since all Administrative Assistants for this study are women.

The results of the pairwise comparisons for the Interpersonal scale also suggest that Field Engineers, Project Engineers and Executives, on average, all score higher than Superintendents. This is in line with the 'mild evidence' that suggests field experience has a negative effect on Interpersonal skills.

In regards to the Interpersonal Relationship differences, the findings reveal that Administrative Assistants, on average, significantly score higher than Office Engineers, Estimators, Project Managers, Superintendents and Executives. Once again, future research should entertain the possibility of gender driving these significant differences.

In addition, Field Engineers significantly score higher than Project Managers and Superintendents on the Interpersonal Relationship scale. The results also indicate that Office Engineers and Project Engineers significantly score higher than Superintendents. In this case, the high scorers (Office, Field, and Project Engineers) are usually younger and have less experience than the lower scorers (Project Managers and Superintendents). This relationship is not in line with the results of the age investigation. However, the higher scoring over the Superintendent is in agreement with the results of the field experience investigation.

The higher scoring over the Project Manager could also be effected by the field experience factor if the Project Managers had significant field experience. Therefore, the researcher decided to calculate the average years of field experience for the concerned position levels. These results reveal that the Project Managers have an average of 11.8 years of field experience, whereas the Office, Field, and Project Engineers only have an average of 2.0, 1.9, 2.1 years field experience, respectively.

Objective 5: Field vs. Office Employee

The fifth objective identifies if there are any differences in EQ levels between Field and Office employees. The results from this study did not reveal any significant differences in the scores of the EQ scales between Field and Office employees. One possible explanation for this could be that many of the General Contracting employees of this study have significant amounts of both field and office experience. This would make it unfair to classify one of them based merely on their current position. Future research should investigate what differences might exist between employees that have worked primarily as field or office employees and employees that possess relatively equal amounts of office and field experience.

Objective 6: A/E Interaction

The sixth objective entertains the idea that there may exist differences in EQ levels between General Contracting employees based on their interactions with Architects and Design Engineers. The findings of this study indicate that General Contracting employees who interact more frequently, with Architect/Design Engineers, also possess lower levels of Stress Management abilities. This suggests that they might have trouble at times holding up to stress without falling apart or breaking down. They might also have trouble fighting their impulses. One possible explanation of this is that the General Contracting employees who usually interact with the Architects/Design Engineers the most are usually the ones with decision-making power. Decision-making power is almost always followed by accountability, which creates large amounts of stress. Therefore, this negative relationship between frequent Architect/Design Engineer interaction and Stress Management may be because those with frequent interaction have the more difficult types of stress to deal with.

In regards to the quality of Architect/Design Engineer interaction, the results did not indicate any evidence that the quality of the interactions had an effect on the EQ levels of General Contracting employees.

Objective 7: Company Size

The seventh objective addresses possible differences between General Contracting employees of large- and small-volume companies in regards to EQ levels. Large-volume companies were defined as employing 1000 or more employees, while small-volume companies were defined as employing less than 1000 employees.

There are several significant differences concerning company size, all resulting in higher levels for the General Contracting employees of the small-volume contractors. General Contracting employees working for small-volume contractors possess significantly higher levels of Interpersonal skills, including Empathy and Interpersonal Relationship skills. This implies that small-volume General Contracting employees are more confident and successful in their interpersonal interactions and functioning. This may be a result of small-volume General Contracting employees working on smaller project with less people. Working on a project with less people would, for one, suggest fewer interactions to deal with. In addition, these interactions, more than likely, would be more meaningful and comfortable. This would allow for a General Contracting employee to be more confident and aware.

The results of this study indicate that small-volume General Contracting employees have greater levels of Self-Awareness than large-volume General Contractors. This suggests that small-volume General Contracting employees are usually very conscious of their feeling, thoughts, and emotions. Once again, there is a good possibility that this is due to working on smaller projects. With smaller projects, there are fewer decisions and people to deal with. This usually allows for more time to spend on each situation, which in turn provides for more time to reflect.

Objective 8: GC Perceptions

The eighth objective reveals what perceptions General Contracting employees have of the different sectors of the A/E/C industry. These sectors are identified as the

General Contracting, Architecture/Engineering, Owner, and Subcontractor sectors. Since the A/E/C industry is very confrontational, it would seem logical that General Contracting employees would perceive themselves as being better than the other sectors. The results from this study agree with this statement. General Contracting employees perceived the Total EQ level of themselves as the highest, followed by Architects/Engineers, then Owners, and finally, Subcontractors. However, these differences were not as great as one might expect.

Objectives 9 and 10: Self-Perception of (9)Empathy and (10)Interpersonal Relationship

The ninth and tenth objectives investigate whether or not the manner in which General Contracting employees view themselves in certain emotional intelligence areas share a relationship with how they actually score on the EQ-i. Responses to a question regarding what one thought of their own Empathy abilities correspond significantly and negatively to how they scored on the EQ-i. This suggests that those who rank their own Empathy abilities as high score low on the EQ-I Empathy scale, and vice-versa

In addition, the results of this study indicate that the responses to a question regarding what one thought of their own Interpersonal Relationship abilities correspond negatively and very significantly to how they score on the EQ-i. This suggests that those who rank their own Interpersonal Relationship abilities as high score low on the EQ-i Interpersonal Relationship scale, and vice-versa.

These results are interesting. They indicate that General Contracting employees have very poor self-perceptions of their Interpersonal Relationship abilities their Empathy abilities. It is recommended to that future research investigate what other General Contracting employees' self-perceptions might be inaccurate.

5.2 Limitations

Similar to most research studies, the present study experienced several limitations. The first limitation encountered by the researcher pertains to the assessment instrument. Every expert in the field of emotional intelligence agrees that there does not exist a "perfect" assessment of emotional intelligence. As such, this equates to the instrument used in this study not being "perfect." The researcher feels there are two major limitations that could result from the imperfection of this instrument. First, respondents may misinterpret certain items or may feel that not all available responses reflect their true opinion. Second, the definition of emotional intelligence used by the instrument is restricted to five specific factors: Intrapersonal, Interpersonal, Adaptability, Stress Management, and General Mood. It is possible that there exist other factors that affect communication and teamwork.

Despite these limitations, there have been sufficient studies conducted which support the usefulness of this instrument. The researcher feels confident that this instrument will provide meaningful results.

In addition, due to the limitations mentioned in the Scope Limitations section, the sample population was not random. The researcher was constrained to a sample population that consisted of employees of companies that voluntarily chose to participate. This could bias the collected data.

Another limitation encountered during this study occurred during the administration of the instruments. Unfortunately, not every environment was identical. Although each administration took place in a "conference room," these conference rooms varied from extremely spacious, quiet, and audio/video equipped to jobsite trailers where a laptop had to be used for the presentation and the participants had to deal with ongoing construction noise. The presentation quality, participant comfortableness, or any other of many environmental factors may have biased the collected data.

A third limitation was the procedure used to develop the Personal Information Sheet (PIS). The researcher did seek outside assistance in the development of the instrument, by means of a peer group, but the PIS was never tested for validity. Therefore, it is possible that some of the questions or response formats were not statistically sound.

A final limitation observed by the researcher of this study occurred during the data analysis procedure. From the results, it was observed that Administrative Assistants consistently scored significantly higher on many of the EQ levels than other position levels. In addition, the Administrative Assistant sample consisted of only females. However, the sample population as a whole did not yield an appropriate ratio of females to males allow for any analysis. Therefore, there does exist the possibility that some of the relationships suggested by the results may be driven by a gender factor.

5.3 Key Findings and Future Research

The present research study suggests many key findings. These finding are important as they provide an initial understanding of the emotional intelligence within the A/E/C industry, as well as several recommendations for future research. Table 5-1 summarizes the key findings of this research study and the recommended directions of future research for each finding.

Table 5-1 Summary of Key Findings and Future Recommendations

Objective	Key Finding	Value	Future Research Should:
1	Low EQ Interpersonal levels for GC sector	Score = 93.9	Explain Why and What Can Be Done
2	Age affects EQ Flexibility levels negatively	p=0.088, r=-0.168	Confirm or Deny
2	Age does not affect most of the EQ levels		Explain Why
3	Field Experience negatively affects EQ Interpersonal Relationship levels	p=0.0004, r=-0.339	Explain Why and What Can Be Done
3	Field Experience negatively affects EQ Self-Awareness levels	p=0.017, r=-0.234	Explain Why and What Can Be Done
3	Office Experience positively affects EQ Empathy levels	p=0.020, r=0.228	Confirm Not a Result of Age
4	Differences between position levels in regards to EQ Interpersonal and Interpersonal Relationship levels	p=0.008 p=0.013 respectively	Explain Why Explain Why
7	Small-volume companies have higher levels of EQ Interpersonal, Empathy, Interpersonal Relationship, and Self-Awareness levels	See Table 4-9	Explain Why as Opposed to Large-Volume
8	GC sector self-perceives as highest EQ sector	See Table 4-10	Investigate If True for Other Sectors
9	GC sector self-perceives EQ Empathy level poorly	p<0.01, r=-0.30	Identify Other Self-Perceptions
10	GC sector self-perceives EQ Interpersonal Relationhsip level poorly	p<0.01, r=-0.54	Identify Other Self-Perceptions

Of notable interest is the finding of low scores on the Interpersonal scales. As established in the Review of Literature section, and confirmed by the results of the present study, interpersonal skills are important to the success of a project and are currently at low levels within the A/E/C industry.

This area of future research should first start by exploring possible causes for the lack of interpersonal skills. The results of this research study suggest that some factor related to field experience significantly effects the interpersonal skills of General Contracting employees in a negative manner. The researcher recommends that future research explain this suggestion. Once future research identifies certain causes to the problem of interpersonal skills, it needs to focus on identifying procedures that can be implemented to stop, if not reverse the effect of these causes.

Another finding of the study that is worth pointing out is the possible effect of age on Flexibility. Flexibility becomes a critical factor as the A/E/C industry moves toward a more collaborative environment. Members of the industry will have to learn to interact more frequently and intimately with parties they are not used to. This becomes a difficult matter without having Flexibility. This study has suggested, but not confirmed, a negative effect of age on Flexibility levels. Future research needs to first confirm or deny this relationship.

Additionally, although the results did suggest that age effects Flexibility, they did not suggest much else. This is interesting since research in other industries has suggested that EQ levels do increase with age (Bar-On and Parker 2000). It would be beneficial to discover why the A/E/C industry does not conform to the same pattern of emotional intelligence as many other industries.

In addition to the key findings, this study has also performed several tests that have not been discussed in the Results or Discussion sections. These tests pertain to the pairwise comparisons of EQ levels between position levels. Several pairwise comparisons have been performed between position levels for EQ levels that have not met the required significance level for the ANOVA test. The results of these comparisons can be found in Appendix G. These results are intended to help guide and provide support for future research.

From the researcher's experience with this study, it must also be recommended that future research examine the effect of company characteristics. It would be very interesting to see if companies that self-performed scored differently than those did not. It would also be interesting to see if there existed a difference in EQ levels between private- and public-sector companies. To explore the possibilities of EQ differences between companies, the researcher analyzed company grouped data using the ANOVA test. These results can be found in Appendix G.

A final recommendation for future research relates to investigating possible connections between EQ levels and success factors of General Contracting employees. Although this was beyond the scope of this project, it is an area that interests the researcher to a great extent. As of now, one can only make assumptions about which high EQ levels are important to possess based on the environment of the A/E/C industry. However, if would be very meaningful to find supportive data that indicates which EQ areas contribute the most to the success of General Contracting employees, as well as projects within the A/E/C industry.

Overall, the present research study contributes to the growing research that focuses on social and/or "soft" topics within the A/E/C industry. This study serves as an exploratory study for which more detailed and meaningful research can begin. Because of the success of Emotional Intelligence theory in other industries, as well as its proven ability to be actively improved, it is important to consider this concept in future research.

5.4 The Next Phase

As a final note, the researcher has decided to set up a few guidelines for the next phase of this research study. The purpose of the present study was to explore the concept of emotional intelligence within the construction industry. The present study has identified several interesting relationships between certain emotional intelligence variables and other construction variables. The next phase of this research area should confirm and/or disprove these relationships. It will also be important for future studies to explain the reasoning behind the findings.

Because of the nature of an exploratory study, no hypotheses were established during the initial stages. However, now that possible relationships have been discovered, it is important that the next phase of this research area set up initial hypotheses to prove or disprove. These hypotheses should be established based on the exploratory findings found within the present study.