

GENERAL CONTRACTOR EMOTIONAL INTELLIGENCE IN THE CONSTRUCTION INDUSTRY

Anthony D. Songer¹ and Brian Walker²

Associate Professor, Department of Civil Engineering, Virginia Polytechnic Institute and State University, 200 Patton Hall, Blacksburg, VA 24060, USA.
Project Engineer, Turner Construction Company, Denver, Colorado, USA.

In the construction industry, the major project participants include the owner, the architect, the contractor and the subcontractors. Traditionally, each participant's activity in the construction process has been isolated to its particular organization's goals. In recent years, one of the leading trends of project deliveries 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. Emotional intelligence reflects an individual's emotional awareness and emotional regulation, both important factors of social interaction. An initial understanding of project participant emotional intelligence will provide meaningful direction for developing collaborative construction environments. This research study investigates the 21 components of the Bar-On Emotional Quotient Inventory (EQ-i) and establishes initial emotional intelligence benchmarks within the construction industry. This study explores trends and relationships relative to demographics and General Contractor characteristics. This study adds to the growing body of knowledge focusing on the impact of social factors on the A/E/C industry. The results of this study provide an initial understanding of the emotional intelligence levels of the General Contracting sector and directions for future research.

Keywords: collaboration, communication, emotional Intelligence, social Intelligence, sociology

INTRODUCTION

In the construction industry, the major participants include the owner, the architect, the contractor and the subcontractors. Traditionally, decision priorities during the project cycle focus on the motives of each participant's organization. However, 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

¹ email: adsonger@vt.edu

and emotional regulation are important factors. In order to gain an improved understanding of the fundamental elements of effective interaction, it is important to investigate these emotional factors. The theory of “emotional intelligence” addresses these factors.

Emotional intelligence refers an individual’s ability to identify emotions in oneself and others and to exhibit appropriate responses to environmental stimuli.

Investigating emotional intelligence among construction project participants establishes a foundation for understanding the underlying obstacles of effective interaction. Therefore, the authors conducted an exploratory investigation of emotional intelligence within the general contracting sector of the construction industry. This paper provides a background on emotional intelligence and why it is an important concept to investigate in the construction domain. Additionally, the paper discusses the research method and results of the exploratory study.

BACKGROUND

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, best value procurement, negotiated contracts, and construction management. These delivery systems are unique in their own way. However, for most of their contract forms, they typically share one thing in common; they 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. Hans J. Thamhain’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; Johnson and Singh 1998; Loosemore 1998; Thomas, Tucker et al. 1998; Black, Akintoye et al. 2000; Bresnen and Malouff 2000; Bresnen and Marshall 2000; Cheng and Li 2001; Carr, M. de la Garza et al. 2002; 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 builds upon the current research ambitions within A/E/C industry and extends the ideas of Ling and others. In particular, the research investigates the area of "emotional intelligence." Measuring project participants' levels of "soft" skills and abilities (emotional intelligence) provides a better understanding of the challenges and barriers impeding effective collaboration within the construction industry.

What is Emotional Intelligence?

In recent 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 (1998) 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. 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. Their research, along with others such as Goleman and Dr. Reuven Bar-On, has resulted in three varied frameworks for emotional intelligence. 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.

Why Emotional Intelligence?

Much of the research conducted on emotional intelligence has focused 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, which includes 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 the 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.

RESEARCH METHODOLOGY

Participants

Participants were 104 employees from seven US Mid-Atlantic general contracting organizations. They were all involved with the construction operations of their respective organizations. Position levels of the participants included administrative assistants, field engineers, office engineers, project engineers, estimators, project managers and superintendents. The participants were recruited via personal contact with company representatives. They were compensated for their time with feedback on their individual emotional intelligence levels.

Assessment

This investigation of the General Contracting sector was conducted as an exploratory study to confirm the merit for a larger study focused on investigating the role of emotional intelligence in the A/E/C industry. As part of the present study, participants attended a 45-minute administration session. This session included a brief introduction of emotional intelligence and the purpose of the study, as well as the assessment of the paper and pencil version of the BarOn Emotional Quotient Inventory (BarOn EQ-i™) for measuring emotional intelligence. In addition, participants completed a one-page questionnaire that measured certain variables used for analyzing the results of the emotional intelligence tests.

The most current version of the BarOn EQ-i, at the time of administration, was a self-report questionnaire that consisted of 133 items, all phrased in the first-person

singular. 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 (Bar-On 2000).

Responses to the BarOn EQ-i produced a score for the Total EQ scale; scores for 5 composite scales (Intrapersonal, Interpersonal, Stress Management, Adaptability, and General Mood); and scores for 15 subscales. Raw scores were normalized using norms for the general population of North America. As such, a score of 100 points represents exactly average.

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. The four validity scales were used to filter out invalid responses from the data analysis procedure.

FINDINGS

Detailed statistical analyses of the research assessment are available from the authors and will be archived in a journal article. Significant findings involved EI composite scale of interpersonal levels relative to the general construction population, position type, position level, and company size. Additionally, the relationship between the EI composite scale of self awareness and company size was significant. A general discussion of these key findings is provided below.

Low Interpersonal Levels

This study found that General Contracting employees scored considerably lower than the general population on *Interpersonal* levels. This deserves considerable attention. As previously discussed, communication and interactions between project participants is important to the success of a project. Therefore, to increase the likelihood of a project being successful, project participants need to have high levels of interpersonal skills. According to this study, this is not the case for the current state of the General Contracting sector. It becomes important to conduct further research to investigate why these conditions exist and how they can be improved.

Impact of Field and Office Experience

Surprisingly, participants with greater amounts of field experience scored lower on the *Self-Awareness* and *Interpersonal Relationship* subscales. This is an interesting finding with many possible implications. One possibility would be to jump to the conclusion that these findings have negative connotations. However, before making this assumption, it is important to focus on the work environment of those participants who work in the field. Field personnel work in a very demanding and physical environment. It can be easily argued that these participants need a “rough” side to be effective in their day-to-day tasks. Due to the exploratory nature of the current study, the research was unable to determine whether the lower scores on the *Self-Awareness* and *Interpersonal Relationship* scales would have a negative or positive affect on the success of field personnel. A great opportunity for future research would be to answer this question.

In regards to office experience, it was found that participants possessing greater years of office experience scored higher on the *Empathy* and *Social Responsibility* subscales. 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 contribute to the “community at large.”

This is an important finding. The *Empathy* and *Social Responsibility* subscales are part of the interpersonal skills previously mentioned that are needed for successful projects. The relationship of office experience and high scores on these two subscales reveals a need to explore possible practices and/or techniques that would promote higher interpersonal skills for construction employees.

Position Level vs. Interpersonal

The present study found several relationships between position levels and EQ levels. Similar to the previously mentioned relationship between field experience and lower *Interpersonal* scale levels, it was found that Field Engineers, Project Engineers and Executives all scored significantly higher on the Interpersonal scale than Superintendents. Field Engineers, Project Engineers and Executives all have less field experience than Superintendents, which provides additional support for the relationship between field experience and lower Interpersonal scores. However, due to the environment of field employees, it is still important to be cautious and not automatically conclude a negative interpretation. Instead, future research should investigate the effect of field employees' *Interpersonal* levels on the success of a project.

Company Size vs. Self-Awareness, Interpersonal

The current study also investigated the impact of company size on EQ levels. This exploration led to several interesting findings. The three small-volume companies, defined as between 150 and 250 employees, were compared with the four large-volume companies, defined as greater than 1000 employees. From this comparison, it was found that the small-volume companies scored significantly higher than the large-volume companies on the *Self-Awareness* subscale, as well as the *Interpersonal* composite scale and its *Empathy* and *Interpersonal Relationship* subscales.

Although this study did not provide information that would reveal the causes for these relationships, it is still an important discovery because it provides evidence that certain company characteristics have an impact on employee EQ levels. Although this research study only examined the size characteristic of companies, it would be beneficial to explore what other company characteristics might influence employee EQ levels. Additional characteristics recommended from the research include the investigation of company culture (type of leadership, motivation and/or training), private versus public sector business, and traditional versus alternative delivery systems.

FUTURE RESEARCH

From the results of this research study, many ideas for future research have surfaced. This study was initially conceived to address communication and interaction issues within the construction industry. The study provided supporting evidence that the General Contracting sector possesses lower than average interpersonal skills. The next logical step in addressing this issue is to conduct future research to investigate why this condition exists and how it can be improved from an emotional intelligence standpoint. As Thamhain's research found (1992), communication and interaction problems have great impacts on the success of a project. This area of future research will be an opportunity to make a great breakthrough in the communication dilemma that the industry faces.

The researchers also recommend exploring the Interpersonal levels of field personnel in greater detail. This study found a tendency for superintendents to have lower levels of interpersonal skills. This study did not investigate how these levels affected their

performance. It is important to determine whether or not the harsh work environment of field personnel have an affect on the value of high Interpersonal levels.

In addition, it would serve as a valuable investigation to research the relationship between company characteristics and EQ levels. By investigating the accomplishments of certain companies, as well as the mistakes of others, the research would provide useful information for how the industry can promote emotional intelligence.

However, in order for the industry to take note of this research, academia needs to investigate the relationships between EQ levels and success factors. Research conducted in other industries concludes that high EQ levels lead to greater success in the workplace. Before the construction industry invests significant resources into this area of research, it is important to confirm that the measurement, emotional intelligence, shares a relationship with successful results.

CONCLUSION

Overall, this research study contributes to the growing area of research focusing on social and/or “soft” topics within the A/E/C industry. More specifically, this study serves as an exploratory study producing sufficient evidence in support for more detailed and meaningful research.

Significant findings include low interpersonal scoring for General Contractor employees and low scoring on self-awareness and interpersonal relationships among field personnel as compared to office personnel. Additionally, office personnel scored higher for empathy and social responsibility. In the category of interpersonal skills, field engineers, project managers, and executives scored higher than superintendents. It was also shown that smaller organization personnel scored higher than large organization personnel for interpersonal skills.

These findings demonstrate interesting relationships and patterns of emotional intelligence among construction project participants. These results, combined with the documented success of emotional intelligence theory in other industries provides the motivation for continued research of this concept within the construction community.

REFERENCES

- Ashforth, B. E. and R. H. Humphrey (1995) Emotion in the workplace: A reappraisal, *Human Relations* 48(2), 97-125.
- Bar-On, R. and J. D. Parker (2000) *The Handbook of Emotional Intelligence: Theory, Development, Assessment and Application at Home, School, and in the Workplace*, San Francisco, Jossey-Bass.
- Bar-On, R. (2002) *The Emotional Quotient Inventory (EQ-i): Technical Manual*, Toronto, Multi-Health Systems.
- Belle, R. A. (1994) Critical Market Forces and Design-Build, *DATELINE*. I, 5.
- Black, C., A. Akintoye, et al. (2000) An analysis of success factors and benefits of partnering in construction, *International Journal of Project Management* 18, 423-434.
- Bresnen, M. and N. Marshall (2000) Partnering in construction: a critical review of issues, problems and dilemmas, *Construction Management and Economics* 18, 229-237.
- Bresnen, M. and J. Malouff (2000) Motivation, commitment and the use of incentives in partnerships and alliances, *Construction Management and Economics* 18, 587-598.

- Campion, M. A. (1996) Relations between work team characteristics and effectiveness: a replication and extension, *Personnel Psychology* 49, 429-453.
- Carr, P. G. (2000) *An Investigation of the Relationship between Personality Traits and Performance for Engineering and Architectural Professionals Providing Design Services to the Building Sector of the Construction Industry*. Unpublished Ph.D. thesis, Civil Engineering. Blacksburg, Virginia Polytechnic Institute and State University.
- Carr, P. G., J. M. de la Garza, et al. (2002) Relationship between Personality Traits and Performance for Engineering and Architectural Professional Providing Design Services, *Journal of Management in Engineering* 18(4), 158-166.
- Cheng, E. W. L. and H. Li (2001) Development of a conceptual model of construction partnering, *Engineering Construction & Architectural Management* 8(4), 292-303.
- Folkman, S. and R. S. Lazarus (1988) Coping as a mediator of emotions, *Journal of Personality and Social Psychology* 54, 466-475.
- Gardner, H. (1993) *Multiple Intelligences*, New York, Basic Books, Inc.
- Gibson, J. L., J. M. Ivancevich, et al. (2003) *Organizations: Behavior, Structure, Processes*, New York, McGraw-Hill/Irwin.
- Goleman, D. (1998) *Working with Emotional Intelligence*, Bantam.
- Goleman, D., R. Boyatzis, et al. (2001) Primal Leadership, *Harvard Business Review* 79(11), 42-51.
- Gowing, M. K. (2001) Measurement of Individual Emotional Competence. The Emotionally Intelligent Workplace: How to Select for, Measure, and Improve Emotional Intelligence in Individuals, *Groups, and Organizations*. C. Cherniss and D. Goleman, San Francisco, Jossey-Bass, 83-131.
- Johnson, H. M. and A. Singh (1998) The Personality of Civil Engineers, *Journal of Management in Engineering*, 14(4), 45-56.
- Kemper, C. L. (1999) EQ vs. IQ, *Communication World* 16, 15-22.
- Ling, F. Y.-Y. (2002) Model for Predicting Performance of Architects and Engineers, *Journal of Construction Engineering and Management* 128(5), 446-455.
- Loosemore, M. (1998) The methodological challenges posed by the confrontational nature of the construction industry, *Engineering Construction & Architectural Management* 5(3), 285-293.
- Mayer, J. D., D. R. Caruso, et al. (1999) Emotional intelligence meets traditional standards for an intelligence, *Intelligence* 27, 267-279.
- Mayer, J. D., P. Salovey, et al. (2000) *Models of Emotional Intelligence*, Handbook of Intelligence, R. J. Sternberg. New York, Cambridge University Press, 397-420.
- Metcalf-Kupres, K. (2001) *The evolution of design-build construction*, Consulting-Specifying Engineer, 8-10.
- Pocock, J. B., L. Y. Liu, et al. (1997) Impact of Management Approach on Project Interaction and Performance, *Journal of Construction Engineering and Management* 123(4), 411-418.
- Sala, F (2003) *Do Programs Designed to Increase Emotional Intelligence at Work - Work?* Boston, H/McBer, 1-6.
- Scheusner, H. (2002) *Emotional Intelligence Among Leaders and Non-Leaders in Campus Organizations*. *Educational Leadership and Policy Studies*, Unpublished Ph.D. thesis, Blacksburg, Virginia Polytechnic Institute and State University.

- Schutte, N. and J. Malouff (1999) *Measuring emotional intelligence and related constructs*, New York, The Edwin Mellon Press.
- Singh, A. (2002) Behavioural perceptions of design and construction engineers. *Engineering Construction & Architectural Management*, **9**(2), 66-80.
- Thamhain, H. J. (1992) *Engineering management, managing effectively in technology-based organizations*, New York, John Wiley & Sons, Inc.
- Thomas, S. R., R. L. Tucker, et al. (1998) Critical Communications Variables, *Journal of Construction Engineering and Management*, 58-66.
- Thorndike, E. L. (1920) *Intelligence and its uses*, Harper's Magazine 140, 227-235.
- Williams, W. and R. Sternberg (1988) Group intelligence: Why some groups are better than others, *Intelligence*, **12**(4), 351-377.