

Organizational Excellence: A Study of the Relationship Between Emotional Intelligence  
and Work Engagement in Process Improvement Experts

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Organizational Excellence: A Study of the Relationship Between Emotional Intelligence  
and Work Engagement in Process Improvement Experts

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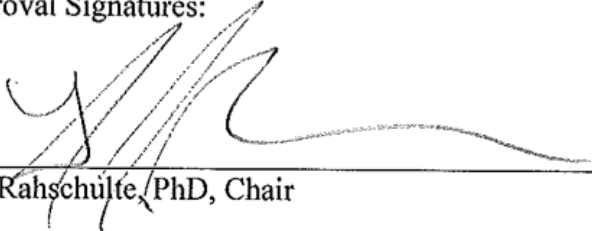
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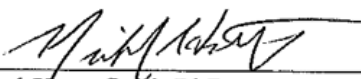
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### Abstract

The role of a quality leader has changed significantly over the past several decades from chief inspector, primarily focused on detection activities, to one in which the attention has shifted to prevention and improvement initiatives (Addey, 2004). Many of the traditional responsibilities related to quality control have been integrated into the role of all employees. In a sense, each individual is now responsible for the quality of the processes they work within, and little external quality control is needed. The transformation of the quality function away from control activities has led to initiatives such as Total Quality Management (TQM), and most recently Lean Six Sigma. Both TQM and Lean Six Sigma place a heavy emphasis on creating a culture of teamwork and continual improvement. Two potential elements that may impact the success of process improvement experts working in such environments are their level of emotional intelligence and work engagement. Research suggests that individuals with high emotional intelligence outperform those with low intelligence (Bar-On, 2006; Goleman, 1995, 1998; Nadler, 2010; O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011), and organizations with high employee engagement are more successful than those with low engagement (Harter, Schmidt, Asplund, Killham, & Agrawal, 2010; Towers Perrin, 2003, 2007; Wagner & Harter, 2006). Despite the link to individual and organizational performance, the research studying what drives engagement is sparse (Schaufeli & Bakker, 2010). The research that does exist argues much of the driving force behind engagement is controlled by external factors such as available resources, working environment, and leadership support (Towers Perrin, 2003, 2007; Wagner & Harter,

2006), but research focused on individual characteristics, such as emotional intelligence, has yet to be studied. This research sought to better understand the relationship between emotional intelligence and work engagement. Taking a quantitative approach, the research utilized the Assessing Emotions Scale to measure emotional intelligence, and the Utrecht Work Engagement Scale to measure work engagement of 5,187 process improvement experts. Correlation analysis indicated a moderate statistically significant relationship existed ( $r = .416$ ). Regression analysis indicated emotional intelligence predicted 17.3% of the variability in work engagement. Gender, education, and organizational level had a significant effect on emotional intelligence, whereas age was found to have no effect. Education, organizational level, years in current position, and not having an ASQ certification were also found to have a significant effect on work engagement, whereas age, gender, and having a Six Sigma certification had no effect. Implications of the findings and recommendations for future research are also discussed.

*Keywords:* emotional intelligence, employee engagement, process improvement, Lean,

Lean Six Sigma, Six Sigma, TQM, work engagement

### **Dedication**

This dissertation is dedicated to my grandfather, Randolph “Randy” Hoffman. Despite having no more than an eighth grade education he lived the American Dream and was the picture of work engagement. His vigor, dedication, and absorption for his work was the inspirational fuel I tapped into when I struggled to engage myself in this dissertation. I have no doubt he is smiling down on me today as I complete what I never thought was possible.

### Acknowledgements

Although a dissertation is completed by one individual it takes the support of many to complete the process, and I acknowledge them here for all the support they have provided in this challenging and rewarding journey.

First and foremost, I credit my faith in God as a primary source of motivation and support that was essential in helping me achieve my goal of a doctoral degree. I also have to acknowledge my loving wife, Jana, who endured the countless mornings I snuggled not with her, but instead with the writing, reading, and data compiling documented in this body of work—I promise there will be more snuggling with you in the future!

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### Definition of Terms

Emotional Intelligence: “the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10).

Lean: A method of improvement based on Japanese manufacturing concepts that include mapping value streams within an organization, and identifying areas that include processes that are non–value added (those a customer is not willing to pay for), and either eliminating the process or minimizing it (Womack & Jones, 1996).

Lean Six Sigma: A combination of lean and Six Sigma typically starting with lean to eliminate non–value added activities followed by Six Sigma to reduce the variation of those processes remaining (George, 2002). The methodology is also referred to as Lean Sigma.

Process Improvement Expert: An individual who is responsible for developing, implementing, and leading improvement strategies within an organization. They typically hold the title of quality technician, quality engineer, green belt, black belt, master black belt, quality supervisor, quality manager, quality director, or vice president of quality. An expert for this study was defined as having five or more years of process

improvement experience, Six Sigma certification, and/or American Society for Quality (ASQ) certification.

**QMS: Quality Management System.** A management system (processes, procedures, strategies, etc.) that is used to improve the performance of an organization (Okes & Westcott, 2001). Example systems include the Malcolm Baldrige National Quality Award and ISO 9000.

**Six Sigma:** A process improvement methodology that uses statistical tools and a structured approach consisting of five phases that include define, measure, analyze, improve, and control (DMAIC) that is used to reduce variation and costs, which lead to increased customer satisfaction and profitability (George, 2002). Statistically, Six Sigma quality is quantified as 3.4 defects per million opportunities.

**TQM:** “a customer–focused management process of continuous improvement that utilizes employee involvement and the appropriate application of the technical tools of quality” (Hoover, 1995, p. 83).

**Work Engagement:** “a positive, fulfilling, work–related state of mind that is characterized by vigor, dedication, and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective–cognitive state that is not focused on any particular object, event, individual, or behavior” (Schaufeli & Bakker, 2004, p. 4-5).

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## Chapter 1

### Introduction

There is little disagreement the quality profession has changed drastically in the past several decades. The role of the quality professional has transformed from chief inspector, primarily focused on detection activities, to one in which the attention has shifted to prevention and improvement initiatives (Addey, 2004). Arguably, this shift has created the need to better understand the individuals tasked with leading process improvement activities and less so on the product or service being provided.

Much of the transition is credited to the work conducted by W. Edwards Deming and Joseph M. Juran. Deming's (2000) 14 points placed a heavy emphasis on building quality into products and services, and Juran's quality trilogy centered on quality planning, quality control, and quality improvement (Bisgaard, 2008). Both were pioneers in creating a paradigm shift in the quality profession, which has led to the most recent advancements in organizational efficiency such as Total Quality Management (TQM), Lean, and Six Sigma.

TQM came to prominence in the 1980s as the U.S. manufacturing industry struggled to compete with their Japanese counterparts. Hoover (1995) defined TQM as, "a customer-focused management process of continuous improvement that utilizes employee involvement and the appropriate application of the technical tools of quality" (p. 83). As TQM came to prominence in the U.S. during the 1980s, lean manufacturing began to gain popularity in the 1990s.

The evolution of lean manufacturing began after World War II with Taiichi Ohno at Toyota and became known as the Toyota Production System (TPS) (Liker, 2004). Womack, Jones, and Roos (1990) coined the term “lean” (p. 13) since TPS uses fewer resources than traditional manufacturing methods. Lean differs from TQM because whereas TQM focuses on customer satisfaction, teamwork, and continuous improvement, the primary focus with Lean is on removing waste, or “muda” (Womack & Jones, 1996, p. 15) as the Japanese refer to it, in manufacturing and service processes. Any non-value added activities, those that a customer is not willing to pay for, are considered waste, and the goal of Lean is to remove them from process streams. As Lean gained prominence in the U.S. manufacturing industry during the 1990s, Six Sigma also became increasingly popular as companies such as Motorola and General Electric utilized the methodology to reap millions of dollars in cost savings (Pheng & Hui, 2004).

Six Sigma literally translates to 3.4 defects per million opportunities, nearly a perfect level of quality. Motorola is largely credited with creating the Six Sigma method of process improvement (Pheng & Hui, 2004). As efficiencies were realized, Lean and Six Sigma came together as complimentary process improvement methodologies (Shah, Chandrasekaran, & Linderman, 2008; Snee & Hoerl, 2007). Lean focuses on minimizing and/or eliminating wasteful non-value added processes, Six Sigma serves as a measurement target aimed at reducing the variation and strives for perfection in the remaining value-added processes. Process improvement experts referred to as “belts” (George, 2002, p. 102) lead the Lean Six Sigma efforts, and have varying degrees of certification related to their level of expertise. Color designations are used to classify the belt’s expertise and include white belt, green belt, black belt, and the highest level, master

black belt. The primary role of the belts is to lead process improvement teams tasked with removing waste and reducing variation. Combining the two methodologies as Lean Six Sigma, also commonly referred to as Lean Sigma, has created perhaps the most robust quality improvement methodology to date. Along with the evolution of quality management utilizing the TQM and Lean Six Sigma methods, the demands on quality professionals have arguably increased (ASQ, 2011; The Conference Board, 2009) as they now play a more pivotal role in organizational success.

The success or failure of TQM and Lean Six Sigma is dependent upon a variety of factors. Research suggests that leadership and teamwork are two key elements to success in TQM and Lean Six Sigma initiatives (Connor, 1997; Corrigan, 1995; Hoover, 1995; Jacobsen, 2008; Pheng & Hui, 2004; Sandholm & Sorqvist, 2002). Several authors have suggested TQM and Lean Six Sigma fail because both employees and leadership are not engaged in the process (Corrigan, 1995; Hoover, 1995; Jacobsen, 2008). Lakshman (2006), in developing a theory of quality leadership, argued increased levels of engagement within an organization will result in higher performance, and quality leader traits such as openness and conscientiousness are key inputs to success. With a focus on the personal characteristics of belts working within the Lean Six Sigma process, Gijo and Rao (2005) argued “the belts should have a strong will to improve” (p. 724). Milivojevic (2006) added to the argument for focusing on the personal characteristics of belts suggesting, “BBs [black belts] must be emotionally intelligent observers and practitioners” (p. 45). What the literature suggests is being engaged and having a sense of emotion is important for process improvement experts leading TQM and Lean Six Sigma efforts.

The concepts of emotional intelligence and employee engagement have received significant attention in both academia and the business popular press in recent years. Much of the attention has focused on the relationship each concept has with organizational results and leadership performance (Bar-On, 2006; Goleman, 1995, 1998; Nadler, 2010; O'Boyle et al. , 2011; Towers Perrin, 2003, 2007; Wagner & Harter, 2006). The attention has not come without controversy related to many aspects of each concept. Debate continues amongst researchers of how best to define and measure emotional intelligence, and whether emotional intelligence is a new type of intelligence or simply another way of assessing personality characteristics (Mayer, Salovey, & Caruso, 2000).

Employee engagement, although not as widely researched as emotional intelligence, also has little consensus amongst scholars and business consultants related to the construct and definition, and has faced criticism in relation to distinguishing itself from similar concepts such as job satisfaction and flow (Schaufeli & Bakker, 2010). Despite the controversies, a burgeoning body of research is helping to establish an argument that both emotional intelligence and engagement are pivotal to organizational success. Because of this argument and the lack of consensus, more research is needed into the constructs of each.

### **Emotional Intelligence Constructs**

Three key constructs of emotional intelligence have taken center stage in the academic literature and popular press (Spielberger, 2004). The constructs can be divided into two groups that include ability-based models and trait-based models, which are also referred to by some researchers as mixed models (Mayer et al., 2000). Salovey and

Mayer (1990) proposed an ability-based model while Bar-On and Goleman have developed trait-based models of emotional intelligence.

Salovey and Mayer (1990) coined the term “emotional intelligence” (p. 185) developing what has evolved into a four-branch ability model of emotional intelligence. Bar-On (1997) developed a five component construct he describes as emotional-social intelligence that in which he coined the term emotional quotient (Bar-On, 1988). Goleman (1995, 1998) is widely credited with popularizing the concept of emotional intelligence by bringing the subject to the broader business audience through his model that specifically focuses on work performance.

The concept of emotional intelligence first appeared in two 1990 journal articles (Mayer, Dipaolo, & Salovey, 1990; Salovey & Mayer, 1990). Salovey and Mayer (1990) originally defined emotional intelligence as “the subset of social intelligence that involves 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). Mayer and Salovey (1997) expanded their original definition of emotional intelligence to “the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (p. 10).

### **Employee and Work Engagement Constructs**

Kahn (1990) first wrote about the concept of employee engagement in the psychological literature describing engagement from three aspects that included

emotional, cognitive, or physical engagement. Kahn argued that people experience states of engagement and disengagement throughout the workday. Further, Kahn believed that employees can be engaged in one or more aspects at the same time, and the higher level an employee is emotionally and cognitively engaged the higher their personal engagement will be.

No single definition for engagement exists that researchers have agreed upon (Schaufeli & Bakker, 2010). Some have suggested that engagement is a product of the workplace environment (Bakker & Leiter, 2010a; Harter, Schmidt, & Hayes, 2002; Towers Perrin, 2003, 2007; Wagner & Harter, 2006), while others have suggested it relates more to what an employee brings to the workplace (Hobfoll, Johnson, Ennis, & Jackson, 2003; Rothbard, 2001). What confuses matters is that the engagement literature has used “employee engagement” (Harter et al., p. 269) and “work engagement” (Bakker & Leiter, 2010a, p. 1) to describe a similar phenomenon.

To clarify this phenomenon and to address the importance of these constructs, this research focuses on emotional intelligence and engagement from an organizational perspective, making the use of the concept of work engagement most applicable. Schaufeli and Bakker (2010) argued that work engagement is a description for the relationship one has with her/his work, whereas employee engagement is the relationship one has with the organization. Bakker, Schaufeli, Leiter, and Taris (2008) described the concept of work engagement as “a positive, fulfilling, affective–motivational state of work–related well being that is characterized by vigor, dedication, and absorption” (p. 187). This construct of work engagement has led to the development of the Utrecht Work Engagement Scale (UWES), which is the most widely utilized engagement

instrument for academic research (Schaufeli, Salanova, Gonzalez–Roma, & Bakker, 2002) and will also be used in this research.

### **Previous Research**

Research in emotional intelligence and work engagement is beginning to build a case that both concepts are related to improvement in individual, leadership, and organizational performance. Individuals who are emotionally intelligent have been found to receive higher performance reviews, have higher rank within a company, and generally outperform those with lower intelligence (Law, Wong, & Song, 2004; Lopes, Grewal, Kadis, Gall, & Saloveyk, 2006; Van Rooy & Viswesvaran, 2004). Research in leadership competencies has also been linked to levels of emotional intelligence (Bar–On, 2006). Studies in work engagement suggest performance feedback, opportunities to learn new skills, autonomy, and social support from managers and colleagues are positively related to work engagement (Halbesleben, 2010; Wagner & Harter, 2006).

What has not clearly emerged from the research is the potential relationship between an individual’s emotional intelligence and their level of work engagement, but the literature suggests the relationship may exist. With a focus on work outcomes, research suggests several factors influence levels of work engagement that include variety in one’s work, coaching, job resources, recognition, and opportunities to learn (Schaufeli & Bakker, 2010; Towers Perrin, 2003, 2007; Wagner & Harter, 2006). Bakker et al. (2008) described the aforementioned engagement factors as “job resources” (p. 191). The researchers grouped the resources into three categories that included social, physical, and organizational aspects. Bakker et al. argued the resources help reduce

psychological and physiological job demands, create an environment conducive to personal growth, learning, and development, and provide support for achieving work goals. Bakker et al. suggested job resources have an influence on both intrinsic and extrinsic motivation of an individual. The researchers argued job resources fulfill a basic human need for such elements as competence and autonomy (Deci & Flaste, 1995). Resources also include external motivators such as support and feedback from coworkers and managers that provide stimulus for achieving work goals.

The majority of research has focused on external factors as antecedents to work engagement, and minimal research has been conducted on internal factors, such as emotional intelligence, despite the argument they may also influence individual work engagement. Research has shown emotional intelligence to be related to concepts similar to engagement such as personal satisfaction (Abraham, 2000; Craig, 2005; Martinez–Pons, 2000; Murray, 1998; Schutte et al. 2001), work attitudes, behavior, and outcomes (Carmeli, 2003), self-esteem (Schutte, Malouff, Simunek, Hollander, & McKenley, 2002), and job satisfaction (Sy, Tram, & O’Hara, 2006). Several researchers have provided guidance to future research related to engagement. Saks (2006) suggested future research should consider the differences in individuals that may help predict engagement. The author argued personality variables may be antecedents to engagement. Kular, Gatenby, Rees, Soane, and Truss (2008) supported Sak’s suggestion related to unique variables, such as individual differences, that may predict engagement. Research centered on the relationship between emotional intelligence and work engagement may provide answers to individual differences that influence and predict engagement. It is clear from the review of current literature that more research needs to



be conducted to better understand whether emotional intelligence has a relationship with work engagement.

### **Significance of the Research**

Process improvement experts are being challenged to focus efforts on TQM, and more recently Lean Six Sigma initiatives, aimed at reducing costs and increasing quality, ultimately leading to higher customer satisfaction and overall organizational effectiveness. Arguably, this will continue as organizations strive to remain competitive in an ever-increasing global market driven by lower cost and higher quality. Successful Lean Six Sigma programs have also been shown to rely heavily on employees who are empowered and motivated (Zu & Fredendall, 2009).

The need to better understand how to increase work engagement is also likely to continue since less than 30 percent of employees consider themselves to be highly engaged (Gallup Consulting, 2008; Towers Perrin, 2003, 2007). Wagner and Harter (2006) summarized data gathered by Gallup from over 10 million data sets measured across more than 100 countries from a wide range of industries that found the following when comparing organizations with highly engaged employees versus those with low engagement. Organizations with highly engaged employees had:

- 27 percent less absenteeism
- 51 percent less turnover
- 51 percent less employee theft
- 62 percent fewer accidents
- 12 percent higher customer satisfaction scores

- 12 percent higher profitability
- 18 percent higher productivity (Wagner & Harter, 2006)

Understanding how to improve work engagement clearly presents a significant opportunity for organizational performance improvement. Gaining greater knowledge into the relationship between emotional intelligence and work engagement may uncover an opportunity to make a substantial impact in the Lean Six Sigma initiatives process improvement experts are tasked with implementing.

### **Purpose and Scope of the Study**

Creswell (2009) suggested quantitative research should be used to test objective theories to measure the relationships between variables. Measuring the variables using instruments allows the numbered data to be analyzed using statistical methods (Creswell, 2009). This research sought to understand the relationship between a process improvement expert's emotional intelligence and level of work engagement, making quantitative research the most appropriate method (Creswell, 2009). Both constructs were measured using survey instruments to quantify the results. The Assessing Emotions Scale (Schutte, Malouff, & Bhullar, 2009), which uses the Mayer and Salovey (1997) construct, was used to measure emotional intelligence. The Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2004) was utilized to measure work engagement. Both surveys were administered online to process improvement experts associated with the American Society for Quality (ASQ). A criteria-based sampling strategy was used to ensure expertise based on five or more years of process improvement experience, Six

Sigma certification, and/or ASQ certification. A total of 5,187 U.S. and Canadian process improvement experts contributed to this research.

Data were analyzed in multiple phases beginning with correlation to understand the strength of the relationship between the variables. A positive correlation among the variables existed, and further investigation focused on the predictive nature of the variables. The second phase of analysis utilized regression analysis to infer predictability of emotional intelligence to work engagement. The final phase included the use of analysis of variance (ANOVA) to determine if a mean difference existed between select demographic characteristics. The results of this research offer process improvement experts a pathway to driving work engagement that may help in successfully executing TQM and Lean Six Sigma strategies.

## Chapter 2

### Literature Review

The review of literature for this research is focused on three key areas that include process improvement/quality management, emotional intelligence, and engagement. The literature review focuses on describing the evolution of quality management and process improvement methods, specifically TQM, Lean, Six Sigma, and Lean Six Sigma, and concludes with predictions for what the future may hold for the quality profession and process improvement. Emotional intelligence is also reviewed, starting with the development of the concept before transitioning into a discussion of the most popular constructs known today. Instruments for measuring emotional intelligence and how performance may be influenced by emotional intelligence are also reviewed in addition to a discussion regarding the controversies related to the concept.

The literature review also includes an overview of engagement. Included in the review are the origins of engagement, contemporary research on engagement, and instruments for measuring engagement. The literature review concludes with an argument centered on the lack of current research focused on internal elements, such as emotional intelligence, that may relate to engagement. The vast majority of engagement research is focused on external factors, such as an individual's work environment and the relationship with their manager. While the external elements have provided insight into engagement, further study of internal elements, such as emotional intelligence, may

provide additional pathways to better understanding and increasing engagement, resulting in improved individual and organizational performance related to process improvement.

### **Quality Management and Process Improvement**

The quality management function has significantly evolved over the last several decades. In a traditional sense the role of quality was initially developed as a mechanism for ensuring control over the output of processes (Addey, 2004). The role of quality was to find defective product before it reached the customer, which placed the quality function in a position of policing an organization's products (Chen, Coccari, Paetsch, & Paulraj, 2000).

Deming (2000) popularized the notion that quality comes not from inspection, but improvement of the process, which led to a paradigm shift in quality management in the 1980s. Deming helped move industry from quality control activities being the primary role of quality, to one of quality assurance, where focus is placed on prevention instead of detection. As the quality function started to evolve from detection to prevention, continual improvement began to take hold in the quality profession with the rise in popularity of process improvement theories and techniques such as Six Sigma, TQM, Lean, and Lean Six Sigma, each of which is detailed hereto.

**Six Sigma and TQM.** Six Sigma began at Motorola in the 1980s and has since gained widespread popularity in the business media based on its success at large organizations such as General Electric and Allied Signal (Mader, 2008; Pande, Neuman, & Cavanagh, 2000; Shah et al., 2008). The six generally accepted aspects related to Six Sigma include:

1. Top management leadership
2. A focus on customer requirements
3. Focus on financial and non-financial results
4. Use of a structured method of process improvement
5. Strategic project selection
6. Full-time specialists (Schroeder, Linderman, Liedtke, & Choo, 2008)

Traditional definitions of quality have focused on meeting tolerances or staying within specification limits. Six Sigma differs from the traditional viewpoint of quality in that Six Sigma's focus is not only on meeting specifications, but also reducing variation. Six Sigma has been compared to TQM, which gained popularity in the 1980s.

TQM programs were introduced to U.S. organizations in response to the competitive onslaught of Japanese companies in the electronics and automotive sectors (Beer, 2003). American organizations had no other choice but to improve their quality management systems (QMS) to keep up with the high quality products coming from Japan. TQM, much like Six Sigma in the late 1990s, was the latest fad on many executive management teams' agendas, hoping it would be the answer to all their problems.

Several definitions and descriptions of TQM exist. Gopal, Kristensen, and Dahlgard (1995) defined TQM as an improvement initiative based on four governing principles:

1. Delight the customer
2. Management by facts
3. People-based management

#### 4. Continuous improvement

Each principle can be used to drive improvement on its own, but the real power of TQM is found in combining each of the principles, building on one another. TQM's primary focus is customer satisfaction and continual improvement, which has some similarities to Six Sigma. Where the two methodologies differ is that Six Sigma takes process improvement a step further, and has an added focus on fact-based problem solving, in addition to a direct link with financial results. One could argue that Six Sigma is the next evolution of TQM.

The statistical definition of Six Sigma is 3.4 defects per million opportunities. The sigma level of a process is calculated by measuring the mean and standard deviation of the process and determining the number of standard deviations that exist between the process mean and the nearest specification. The higher the sigma level is the fewer defects that will be found in the output of the process. The following example illustrates how the sigma level of a process is calculated.

Process average = 100

Process standard deviation = 10

Upper specification limit = 160 (the nearest specification limit to the mean)

Lower specification limit = 20

Sigma level = (nearest specification limit – process average) / standard deviation

Sigma level = (160 – 100) / 10 = 6

While Six Sigma's primary focus is on statistical measures, Six Sigma is more than just a number. Six Sigma is a way of conducting business and creating a culture

focused on continual improvement. Several authors, researchers, and academics have defined Six Sigma in the following ways:

- Harry and Schroeder (2000), two of the initial developers of Six Sigma, defined Six Sigma as a process to significantly improve financial performance through process design and monitoring that reduces waste and resources, and increases customer satisfaction.
- Pande et al. (2000) described Six Sigma as a method that combines the best current techniques with those of the past to reduce defects to near zero, and reduce variation to minimize standard deviations so that products and services meet or exceed customer expectations.
- Snee and Hoerl (2003) defined Six Sigma as a holistic strategy and methodology for improving business performance, integrating proven performance improvement tools to increase customer satisfaction and financial results.

The heart of Six Sigma lies in the process steps consisting of define, measure, analyze, improve, and control (DMAIC) (Brewer & Eighme, 2005). The first step in the process is defining the problem. With the problem defined, the next task is measuring the size of the problem to establish a baseline for improvement, followed by analyzing the collected data to better understand causes to problems, which leads to implementing improvements that are measured against the baseline, and finishing by installing controls to maintain the improvements (George, 2002).

The primary outcome Six Sigma projects strive for is the reduction of variation within a process (George, 2002). Many of the statistical tools utilized in the Six Sigma



process have been around for many years (Naumann & Hoisington, 2001). Such tools as process capability, statistical process control, and error proofing are commonly used in Six Sigma to understand and control variation (Shah et al., 2008). Experts typically lead Six Sigma projects with varying degrees of knowledge in statistical analysis. These improvement specialists are most commonly categorized as master black belts, black belts, and green belts (Bertels, 2003). Master black belts are at the top of the expertise hierarchy and generally manage program implementation, mentor black and green belts, develop and conduct training sessions, and lead in the selection of projects. Black belts primarily act as project managers, leading projects and guiding green belts that are tasked with project oriented activities such as data collection and implementation of improvements and controls.

An argument can be made that the concepts and ideas Six Sigma focuses on are really nothing new, and that Six Sigma only combines existing quality improvement tools into a structured approach to process improvement. Previous quality improvement methodologies, such as TQM, have had mixed results in relation to financial improvement (Fuchsberg, 1992; Powell, 1995). What is unique to Six Sigma is the method's focus on bottom line results, which appeals to senior leaders (Evans & Lindsay, 2005). Many organizations utilizing Six Sigma also employ accounting professionals tasked with quantifying the results of improvement projects (Pyzdek, 2003), which distinguishes Six Sigma from previous quality improvement methodologies (Bertels, 2003; Pande et. al, 2000). Whether or not Six Sigma has greater staying power than previous quality improvement techniques is yet to be determined, but one thing is certain,

if organizations continue to realize financial savings based on Six Sigma the probability of the method's success is sure to increase.

**Lean.** Lean can both be described as a philosophy and also a system, both of which focus on the elimination of waste (Womack & Jones, 1996). Several types of organizational waste exist and can include overproduction, waiting time, product movement, the processing of product, unneeded inventory, unnecessary motion, and defects/rework (Ohno, 1988). Lean evolved from the Toyota Production System (TPS) throughout the course of several decades (Shah et al., 2008). Researchers studying the automotive industry at the Massachusetts Institute of Technology (MIT) in the late 1980s coined the term “lean” (Womack et al., 1990, p. 13) to describe TPS because it typically uses less of everything when compared to mass production. Womack et al. (1990) defined Lean as a production and business philosophy that reduces the time between order placement and the delivery of a product by reducing the amount of waste in a product's value stream. Womack and Jones (1996) built upon their original work at MIT to expand Lean as a way of thinking. The authors argued that Lean thinking consists of five key principles that include:

1. Value
2. The value stream
3. Flow
4. Pull
5. Perfection

Lean thinking begins by defining value, which Womack and Jones (1996) defined as “a capability provided to a customer at the right time at an appropriate price, as

defined in each case by the customer” (p. 311). To truly understand where waste exists, organizations must know what customers value. Understanding the value stream is the next phase of Lean thinking. Womack and Jones defined the value stream as:

The set of all the specific actions required to bring a specific product (whether a good, a service, or, increasingly, a combination of the two) through the three critical management tasks of any business: the problem-solving task running from concept through detailed design and engineering to production launch, the information management task running from order-taking through detailed scheduling to delivery, and the physical transformation task proceeding from raw materials to a finished product in the hands of the customer. (p. 19)

A value stream map, similar to a process flow diagram, is commonly used to illustrate the value stream with the primary goal of understanding where waste within the stream exists. The next step in the process, flow, is where the real breakthrough happens (Womack & Jones, 1996). With a clear understanding of value and the elimination of wasteful processes within the value stream, the focus turns to improving the flow of product and/or services through the value stream as quickly as possible. This can be one of the most challenging aspects of Lean because of the typical function and department mindset most people within an organization have. To truly create flow Womack and Jones argued that organizations need to redefine the work of employees so they can contribute to the process of creating value.

To create flow Womack and Jones (1996) believed a new way of looking at the whole organization is necessary. They called this perspective the Lean enterprise, which

begins by specifying value uniformly throughout the organization, and defining actions needed to bring product from launch to the customer and on through the product's useful life. With these actions complete, the next step becomes removing those actions that do not create value, and making those that do flow as pulled by the customer, which leads to the fourth principle of Lean thinking.

One way to describe pull is from the viewpoint of the customer. The customer can be either an internal process contained within the value stream or an external user of a product or service. Unlike traditional mass production where product is pushed to the next process in large quantities, the concept of pull in Lean thinking is that product should be produced at the rate of which the next process, be it an internal user or the external customer, demands it. The primary benefit of going to a pull system versus a push system is the time it takes to go from product concept to delivery to the customer decreases dramatically (Womack & Jones, 1996). A secondary benefit to pull is a significant decrease in inventory is created, which also increases the levels of cash once invested in raw materials and work in process that can now be invested in other value creating activities. The final principle in Lean thinking is perfection, which initiates the continual improvement process by starting the cycle over and constantly striving for improvement. Lean thinking is a perpetual cycle that continues until there is no waste left within the system.

Unlike Six Sigma, which has a high degree of technical expertise required for success, Lean is considered to require a lower level of competency (Jing, 2009). Most of the tools utilized in implementing Lean are intuitive and require minimal amounts of specialized training (Jing, 2009). The primary tools used in Lean consist of value stream

mapping, 5S, Kaizen, one-piece flow, cellular manufacturing, Poka Yoke, standardized work, and total productive maintenance (Upadhye, Deshmukh, & Garg, 2010).

A value stream map, mentioned previously, is the primary tool utilized to illustrate the value stream to aid in understanding where value is created and waste exists (Womack & Jones, 1996). 5S is a method that can be used to remove waste associated with disorganization of a work environment (Hirano, 1995). The components of the 5S method are sort, set in order, shine, standardize, and sustain. Kaizen is the process of continually implementing small improvement projects focused on removing waste (Cheng & Podolsky, 1996). One-piece flow is a concept that minimizes work in process, which results in reduced inventories, decreases the amount of material handling, and provides quick feedback when a quality problem arises (Sekine, 1992). Cellular manufacturing aims at grouping processes together that produce parts for a similar product to aid in the one-piece flow process (Upadhye et al., 2010). Poka Yoke focuses on error proofing processes to avoid mistakes. Some typical Poka Yoke devices include guide pins, error detection alarms, counters, limit switches, pull-down menus, and checklists (Shingo, 1989). Standardized work establishes best practices based on the best-known sequences using the available resources. A job is broken down into individual steps to determine the most efficient process, which are then used to establish a standard that is taught and sustained through repetition (Jadhav & Khire, 2007). A final key tool utilized in Lean is total productive maintenance (TPM). TPM is an extension of preventive maintenance that involves the operators in the process of maintaining the equipment they utilize (Nakajima, 1988).

Where Six Sigma is an easily quantifiable approach to improvement, it can create an overly complex time consuming method to solving simple problems. Likewise, the subjective nature the Lean tools utilize make it harder to quantify the level of improvements, but the methodology is arguably easier to implement for quicker results. Until recently the methodologies were looked upon as two different approaches for organizational improvement. Only in recent times have the two been combined, creating the next evolution of quality improvement that offers both quantitative statistically-based results when necessary, and rapid less complex initiatives when the need is focused more on simple improvement projects.

**Lean Six Sigma.** Lean and Six Sigma can be characterized by their philosophies, methodology of the tools utilized to implement them, degree of difficulty, duration for a typical initiative, and the level of training and timeframe for implementation. Table 1 summarizes a comparison of Lean and Six Sigma. Both Lean and Six Sigma have a number of similarities and differences.

Table 1

*Comparison of Lean and Six Sigma*

	Lean	Six Sigma
Key focus	Eliminating waste	Reducing variation
Methodology	Specify value, identify the value stream, flow, pull, pursue perfection	Define, measure, analyze, improve, control
Tools	Value stream maps, 5S, Kaizen events, SMED, Kanban, work cells	Control charts, process flows, SIPOC diagrams, scatter plots, Pareto charts
Difficulty	Low, mostly common sense approach, qualitative, subjective approach	High, heavy emphasis on statistics, quantitative, fact-based approach
Typical initiative duration	Event focused, small incremental improvement through quick Kaizen events, taking days to weeks	Project focused, structured approach, typically span several months
Training and implementation	Low complexity training and quick implementation	High complexity training, multiple expertise levels (belts), slow implementation

The most significant similarity between the methodologies is their focus on quality management (Shah et al., 2008). Advocates of Lean quite often suggest the use of process capability and statistical process control when defining Lean (McLachlin, 1997; Shah & Ward, 2003). Advocates of Six Sigma, similarly, emphasize quality management through the use of statistical analysis, which is considered to be the foundation of Six Sigma (Evans & Lindsay, 2005; George, 2002).

Shah et al. (2008) suggested several differences between the methodologies. Six Sigma tends to focus more on invisible problems such as variation within a process, whereas Lean tends to center on problems that are visible such as process flow. Lean is also typically a bottom up approach that has a high degree of involvement from production level employees unlike Six Sigma, which more frequently is driven by projects selected by senior management. The level of expertise or specialization is also significantly higher with Six Sigma due to the heavy statistical emphasis versus Lean, which takes a more practical approach that is more easily understood.

One could argue that Lean and Six Sigma, when combined, represent a methodology of quality improvement that offers the best of both ends of the process improvement spectrum. On one end of the spectrum Lean offers a pragmatic approach that is quick to implement, and is easily grasped by employees with little understanding in advanced data analysis techniques. On the other end of the spectrum Six Sigma provides a data rich methodology when problems are less visible and require more rigorous methods to understand how to improve the process. An argument could also be made that quality professionals trained in both methods will yield higher returns than those trained in only one of the methods.



Snee and Hoerl (2007) argued that Lean Six Sigma offers a holistic approach to quality improvement that is needed to make long-term gains in organizational performance. The authors suggested that by combining Lean and Six Sigma, organizations will be able to more easily create a culture of improvement. Snee and Hoerl also suggested that utilizing a holistic approach to improvement, such as Lean Six Sigma, represents the opportunity to reduce costs, improve quality, and increase the speed of delivery anywhere within an organization throughout the world.

**Challenges and Benefits of Lean Six Sigma.** Lean Six Sigma has the ability, when implemented effectively, to transform organizational cultures into continual improvement environments constantly focused on reducing variation and eliminating non-value added activities, that ultimately result in increased financial performance and customer satisfaction (George, 2002). Like any improvement initiative, Lean Six Sigma can fail for a variety of reasons including lack of management support, poor project and people selection, and the challenge of working with suppliers to establish just-in-time supply chains (George, 2002).

Hoerl (1998), in researching key reasons why Six Sigma is successful, stated that continued support of top management and enthusiasm are critical to achieving positive results. Hoerl described how the promotion process at General Electric now includes a requirement for training in Six Sigma and completion of several projects. Sandholm and Sorqvist (2002) stated the lack of management commitment and visible support is the number one reason why Six Sigma fails. General Electric and Motorola have emphasized the role of top management in their successful Six Sigma initiatives. Sandholm and Sorqvist noted that they are beginning to see a trend in some companies where Six Sigma

is not run by top management, creating a lack of ownership in the process. Another problem Sandholm and Sorqvist described is the role of middle management. The authors suggested getting middle managers involved in the process is a challenge many companies are facing, and without the support of middle management, who are most often responsible for key functional areas within a company where projects take place, Six Sigma is less likely to succeed.

Six Sigma is defined by projects. The challenge lies in picking the right projects. Sandholm and Sorqvist (2002) suggested that the prioritization and selection of projects is critical to the success of a Six Sigma program. Sandholm and Sorqvist stated that several key factors to selecting projects must be considered. They include financial return, customer impact, and productivity improvements. Gijo and Rao (2005) argued that project selection must align with an organization's goals and objectives. Through their research Gijo and Rao uncovered many projects where team members lacked the authority to implement the project or collect valid data, causing projects to fail. Gijo and Rao also stated that companies often place stringent expectations on belts (the Six Sigma experts) causing them to consider everything a project when in fact the solution to the problem is simply a task that needs to be done. Gijo and Rao also wrote that project scope creep creates a problem that can grow into an uncontrollable project that cannot be completed in the expected timeframe.

Lean, despite being significantly less complex than Six Sigma also presents several similar challenges. Upadhye et al. (2010) argued that commitment from top management and total employee involvement is necessary to create a truly lean organization. A second challenge in implementing Lean is working with suppliers to

establish just-in-time deliveries of materials. Upadhye et al. suggested that significant up-front work is necessary to establish the development of efficient supply chains, creating what can be significant investment requirements to implement a lean supply chain.

Even though there are challenges to implementing Lean Six Sigma the research suggests the benefits typically outweigh the disadvantages. Lean has been argued to improve delivery times, reduce defects, increase on-time delivery, increase productivity, and provide an increased return on assets (Lee & Oakes, 1996; Sohal, 1996). Six Sigma has also been widely shown to lead to bottom line savings (Eckes, 2001; Hoerl, 1998).

The evolution of TQM, Lean, Six Sigma, and Lean Six Sigma help make an argument that over the last three decades the role of the quality leader has changed significantly. Camison and Penas (2010) stated in discussing the changes to the quality profession since the 1980s that the changes have led to a “dramatic expansion in the number of quality departments and jobs linked to the function, and hence a relatively new profession (barely 50 years old) has been created as a ripe field of opportunities” (p. 651). The importance of this role has led to an expanded list of responsibilities that requires a multitude of unique abilities that come from experience, training, and education specific to the needs of organizations striving to compete on a global scale (Addey, 2004).

**Characteristics of a quality leader.** Despite the importance of effective quality leadership in organizations competing both domestically and internationally, little research exists in the study of characteristics of quality leaders (Chen et al., 2000; Lakshman, 2006). The American Society for Quality (ASQ), arguably the most recognized quality association in the world with over 85,000 members, offers a

certification in the management of quality and organizational excellence that provides some basis in defining the competencies required to be an effective quality leader (ASQ, 2010).

The body of knowledge ASQ (2010) uses to test individuals seeking certification encompasses seven key areas that include:

1. Leadership
2. Strategic planning and deployment
3. Management elements and methods
4. Quality management tools
5. Customer focus
6. Supply chain management
7. Training and development

The leadership category includes an understanding of organizational structures and culture along with challenges faced by leaders in addition to the effective use of teams (ASQ, 2010). Strategic planning development and deployment describes the use of different strategic planning models, methods for evaluating the business environment, and means by which to deploy a strategic plan (ASQ, 2010). Management elements and methods focus on management skills and abilities, communication, project management, quality systems, and quality models and theories (ASQ, 2010). The quality management tools category centers on problem solving methodologies, process management, and measuring performance (ASQ, 2010). Customer focus revolves around identifying and segmenting customers and maintaining relationships (ASQ, 2010). Supply chain management deals with selecting and communicating with suppliers, establishing

performance benchmarks, creating certifications, partnerships, and alliances with suppliers, in addition to understanding the logistics of working with suppliers (ASQ, 2010). The final category is training and development, which is comprised of developing training plans, completing needs analysis, creating training materials, and evaluating the effectiveness of training efforts (ASQ, 2010).

Based on the ASQ body of knowledge, an effective quality leader must possess a wide array of understanding in the multitude of roles required of the leader (Addey, 2004; Okes & Westcott, 2001). Addey (2004) supported the ASQ requirements, arguing the role of a quality manager is divided into several unique roles. Addey suggested a modern quality manager plays many roles, some of which include salesperson, teacher, consultant, detective, researcher, strategist, and customer.

As a salesperson the quality manager plays a pivotal role in selling the importance of quality as an issue that affects everyone within an organization (Addey, 2004). In the role of a teacher the quality manager continues to act as a salesperson selling the concept of training to other managers (Addey, 2004). As a consultant the quality manager acts as an internal support system to others within the organization facing problems (Addey, 2004). Similar to a crime detective, the quality manager plays a key role in identifying the causes of issues creating quality problems (Addey, 2004). In the researcher role a quality manager is always looking for a better way, and trying to understand theory to put into practice (Addey, 2004). Long-term sustainability is also part of the quality manager's role, always focusing on the future and ensuring initiatives created in the short-term lead to long-term advantage (Addey, 2004). A final role the quality manager plays may arguably be the most important as one of customer. The quality manager

represents the customer in many ways, always ensuring their best interests are constantly in the minds of employees within the organization (Addey, 2004).

Citing the lack of comprehensive research related to success characteristics of quality managers, Chen et al. (2000) undertook a study to determine the perception of quality managers in relation to the effect of seven factors that included:

1. Career path
2. Education
3. Product diversity
4. Organizational structure
5. Tools and techniques utilized
6. Program orientation
7. ASQ affiliation

Chen et al. (2000) described career path as the notion that quality managers need to have in-depth knowledge of products and processes to have a true understanding of how defects could affect the function of a product. The authors divided education into three categories including continuing education at colleges or universities, seminars, and ASQ related training. The researchers described product diversity as the theory that higher diversity inhibits a quality manager's ability to succeed due to a belief that a more diverse product line equates to an increase in quality issues. Chen et al. defined structure as the effect on reporting level of the manager on their performance with the belief that the person a quality manager reports to may have an effect on their success. Tools and techniques are described by the researchers as the methodologies used by the quality manager related to traditional quality methods that include many of the ISO 9000

processes including audits, document control, and corrective actions. Program orientation was referred to by the authors as specific methods used by quality managers such as TQM and Six Sigma. A final element in the research sought to understand if affiliation with ASQ had an impact on a quality manager's perceptions related to success.

Chen et al. (2000) used the Thomas Register of American Manufacturers to sample individuals with job titles that included quality manager, quality control manager, and director of quality. Surveys were completed by 193 participants. Based on the analysis of the responses the researchers concluded educational and on the job experiences were perceived to be important to the success of quality managers. The researchers also found some support for the idea having the title of vice president of quality, director of quality, or chief quality officer enhances success. A final outcome of the research suggested procedures and techniques within the ISO 9000 standard also contribute to the success of quality managers. Summarizing the results, the researchers defined the profile of a quality manager most likely to succeed as the following:

- Experience in multiple departments such as manufacturing, design, testing, assembly, production control, and inspection
- Formal training in techniques such as statistical process control, inspection, and ISO 9000 provided by ASQ, local colleges, and consultants
- Reporting to a high level within the organization
- Stressing the use of traditional tools such as corrective actions and quality records
- Embracing the teachings of Deming and Juran
- Affiliation with ASQ and a regular reader of their journals and magazines

Summarizing the research that exists on the characteristics of successful quality leaders suggests a mix of both hard and soft skills are needed to succeed. ASQ (2010) argued leadership is a combination of strategic insight, problem solving abilities, and project management, in addition to continued focus on customer requirements. Addey (2004) suggested a quality leader also needs to have the soft skills as a salesman and/or teacher to work effectively with people. Chen et al. (2000) described a successful quality leader as having a diverse background based in the concepts fathered by Deming (2000) and Juran (1989), in addition to training in technical skills related to process improvement. Clearly, the path to success is one that is likely to be filled with numerous challenges. Addey (2004) argued, “because the business world has never been more demanding and challenging, the importance of the quality manager’s job has never been so significant.” (p. 888). The author went on to suggest:

To react successfully to these increased demands/pressures, companies will need quality managers who have far wider and more rounded abilities than in previous years; individuals who are able to understand complex business matters and who can address both hard and soft quality issues in an effective way. (p. 888)

**The future of quality management.** In researching the future of quality management, Waddell and Mallen (2001) argued, despite the focus on quality in the 1980s and 1990s when the role of quality leaders was expanding, a shift has begun to take place in which many quality departments are being dismantled. Arguably, some of the shift can be attributed to the sharing of quality responsibilities spread throughout an



organization in which each department is responsible for their own performance (Mallen, 1997).

Waddell and Mallen (2001) provided a comprehensive literature review of recent quality management research focused on identifying the future role of the quality manager. Waddell (1998) surveyed 1,000 randomly selected quality managers in Australia to solicit their perspectives on the future role of the quality manager. Thirty-two percent of managers perceived no change would take place, but surprisingly 19 percent felt that the role of a quality manager would evolve into a smaller role, subcontractor, or that of an internal consultant.

According to Waddell and Mallen (2001), the quality profession is destined for one of four distinct possibilities that include:

1. No change
2. Outsourced
3. Evolve into an integrated function
4. Cease to exist

Increased requirements for certification of quality management systems, argued Waddell and Mallen (2001), will provide a need for quality professionals, and no changes would take place. The second possibility discussed by the researchers is the outsourcing of the quality function, thereby creating a need for short-term engagements that could lead to what Waddell and Mallen described as a new “mobile profession” (p. 382). A third possibility discussed by the authors is the evolution of the quality function merging with other management functions. The researchers suggested this will create a higher visibility position for those formerly working in quality in which they will be tasked with

a wider range of responsibility for process improvement across the entire business. A final possibility Waddell and Mallen discussed is that of extinction for the quality profession. The authors argued quality management may be another fad that ceases to exist in the near future or morphs into something completely new.

Yong and Wilkinson (2002) argued the future of quality may be challenging depending on the view management decides to take in relation to initiatives such as TQM. The authors cited the pessimistic view some organizations have taken in relation to TQM being another “managerial fad” (p. 117). Currie (1999) suggested a challenge to TQM may be coming from new process improvement methods. The author wrote, “While TQM continues to be an important and popular management innovation and change program in the 1990s, it has found new competition and new rivals in the form of BPR and process innovation” (p. 650).

Oakland (2005) offered a perspective on the future of quality suggesting, “people should be the focus for quality professionals in the 21<sup>st</sup> century” (p. 1053). The researcher offered a model described as the “four P’s” (p. 1059) that he argued will be the basis for the future. The four P’s include (1) planning, (2) performance, (3) processes, and (4) people. Planning centers on policy and strategy; performance is focused on development of measures; processes seeks to build quality into processes and continual improvement; and people emphasizes the human side of improvement such as change management, teamwork, and learning (Oakland, 2005).

The Conference Board (2010), a think tank described as, “a global, independent business membership and research association working in the public interest” (para. 1), reported on the future of quality by assembling a quality council consisting of 17

members from various U.S. organizations who were surveyed on their perspectives related to the future of quality. The Conference Board's (2009) report stated, "the quality function is now at a crossroad" (p. 3). The crossroad the quality profession faces deals primarily with the changing role quality may play in the near future. The Board argued quality professionals are likely to be placed in a leadership role that goes beyond process improvement and waste reduction. Companies, argued the Board, will continue to move quality leaders from a production-centered role to a position in which excellence in execution, top and bottom line growth, and customer loyalty and retention are the primary focus. The Board also suggested quality leaders will face challenges related to globalization, customer sophistication, leadership and talent management issues, and environmental management/social responsibilities. The report concluded with suggestions for the quality leader of the future. The Board argued, quality leaders must become a catalyst for change, suggesting leaders "must see the big picture, organizationally" (p. 20), and "they [quality leaders] need to think strategically and be proactive in areas where change is necessary" (p. 20). Leaders also need, argued the Board, to be able to facilitate change and adopt new skills. The Board stated, "not only must the new quality leaders be a catalyst for change, but because they are an expert in the change process they must be the facilitator of those changes" (p. 30). Quality leaders will also need new skills according to the Board, who suggested a change in perspective from functional to holistic will be required. The Board argued a holistic view is needed to develop a greater understanding of the entire system that is responsible for achieving top level objectives within organizations.

Research conducted by Camison and Penas (2010) in Spain focused on the future of the quality/excellence function. The researchers interviewed 58 general managers and quality managers in addition to a panel of 17 experts in the quality/excellence field. They concluded that the future of the quality/excellence function might transition from a line function into a staff role of an internal consultant. Their research revealed that many organizations have already made the transition, and they argued more organizations will do the same as a shift in the profession moves further away from pure quality related issues to operational excellence activities. The researchers also argued organizations are less dependent on quality departments because everyone within the organization is now responsible for quality. Camison and Penas (2010) suggested if the quality function is to remain a separate function quality professionals will have to:

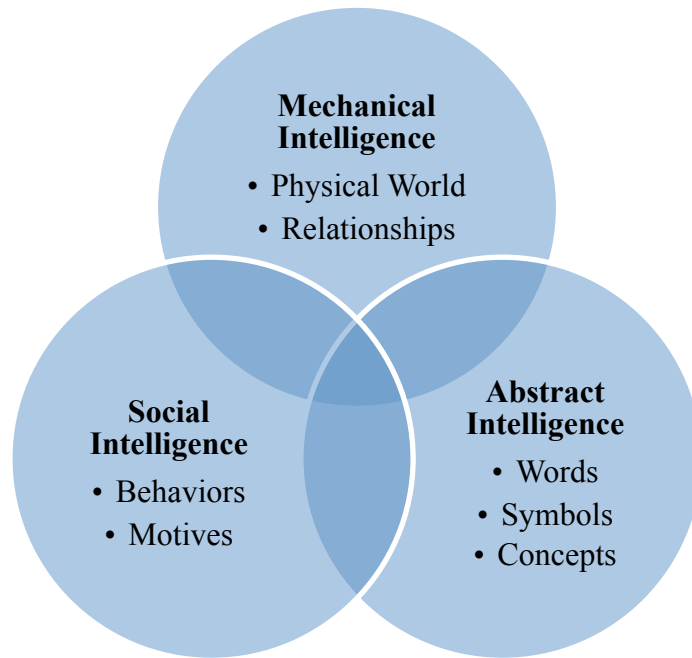
- Focus on customers
- Promote culture change leading to excellence and innovation
- Become involved in strategic planning and performance measurement
- Advocate excellence through the use of systematic processes
- Identify improvement related to all aspects of the business
- Contribute tangible value to internal customers

The research on the future of quality suggest the role is likely to change from what Juran (1989) described as “little-q” (p. 8) to “big-Q.” Little-q focused on purely product quality, whereas big-Q centers on improving all organizational processes. With this shift in focus, quality professionals will move further away from process improvement aimed at improving mechanical processes, and closer to improvement focused on human processes that will, arguably, be of greater challenge.

### **Emotional Intelligence**

The literature on emotional intelligence has grown significantly over the past two decades since Salovey and Mayer (1990) published their first paper on the subject. What has spawned from their work has resulted in a growing industry primarily fueled by consulting organizations promising a pathway to success through a multitude of training programs, tools, and techniques aimed at assessing and increasing emotional intelligence. The academic community has also contributed to the growing popularity of emotional intelligence, creating alternative constructs to describe the phenomenon along with related instruments, discussed later in this literature review, to measure the new theories. To fully understand the evolution of emotional intelligence, a greater understanding of the historical underpinnings of intelligence is helpful.

**Historical underpinnings.** The concept of emotional intelligence is argued to have evolved from thoughts defined by Thorndike (1920) nearly a century ago (Bar-On & Parker, 2000; Goleman, 1995; Mayer & Salovey, 1997; Salovey & Mayer, 1990). Figure 1 illustrates Thorndike’s proposed multiple intelligence theory consisting of mechanical, abstract, and social intelligence.



*Figure 1.* Thorndike's multiple intelligence theory.

Thorndike (1920) argued mechanical intelligence is the ability to visualize relationships between objects to aid in understanding the physical world, and abstract intelligence as the ability to deal with words, symbols, and concepts. While mechanical and abstract intelligence offered new theories of intelligence, it is Thorndike's theory of social intelligence that emotional intelligence researchers often cite as the foundation of contemporary research.

Thorndike (1920) defined social intelligence as "the ability to understand men, women, boys and girls—to act wisely in human relations" (p. 228). Social intelligence, as Thorndike described the concept, centers on understanding the motives and behaviors of one's self and others, and using that information to make optimal decisions, which appears to have similarities with the contemporary view of emotional intelligence.

While Thorndike (1920) is widely considered to have been a foundational influence to emotional intelligence research, debate does exist as to whether Thorndike's coining of the term "social intelligence," rather than his theoretical meaning of the term, is the primary reason for the association to the modern theory of emotional intelligence (Landy, 2005). Landy (2005) conceded that modern emotional intelligence researchers do imply more than Thorndike's use of the term social intelligence, but argued Thorndike was not proposing a theory of multiple intelligences, but instead was arguing against a narrow view of intelligence measures. Landy wrote, "He [Thorndike] simply cautioned against narrowly construed *measures* of intelligence" (p. 416). Landy argued Thorndike was simply a pioneer in the research and development of intelligence measures.

Thorndike's (1920) work led to further study of social intelligence in the decades following the publication of his work. His subsequent research focused on developing

instruments for measuring social intelligence (Thorndike & Stein, 1937). One such instrument was the George Washington Social Intelligence Test (GWSIT). The GWSIT test measured social intelligence based on:

- Judgment in social situations
- Recognition of mental state
- Observation of human behavior
- Memory for names and faces
- Sense of humor (Thorndike, 1936, p. 232)

Thorndike (1936) conducted an analysis of the GWSIT and concluded the test “may tap slightly some unique field of ability, it measures primarily the ability to understand and work with words which bulks so large in an abstract intelligence test” (p. 233). This conclusion led Thorndike to suggest the test was indistinguishable from a standard intelligence test. Landy (2005) argued because of the failure to distinguish social intelligence from cognitive intelligence the concept was criticized or ignored by researchers of the time. Landy went on to argue, because social intelligence offers a weak foundation to build from the modern research movement in emotional intelligence rests upon a weak theoretical basis.

Another early researcher considered influential to the development of emotional intelligence is Wechsler (1939), best known for his development of intelligence tests (Bar-On, 2006; Mayer & Salovey, 1997). Wechsler (1958) defined intelligence as, “the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with environment” (p. 7). Based on Wechsler’s definition of intelligence, one can argue factors beyond analytical thinking abilities, such as emotional



intelligence, may influence overall intelligence. Wechsler (1950), despite having no knowledge of the current emotional intelligence literature, seemed to suggest a similar thought, stating, “general intelligence cannot be equated with intellectual ability, but must be regarded as a manifestation of the personality as a whole” (p. 83). In their review of how Wechsler might view emotional intelligence if he were alive today, Kaufman and Kaufman (2001) suggested the theory of emotional intelligence would support Wechsler’s (1975) definition of what intelligence tests measure. Wechsler stated:

What we measure with tests is not what tests measure—not information, not spatial perception, not reasoning ability. These are only means to an end. What intelligence tests measure, what we hope they measure, is something much more important: the capacity of an individual to understand the world about him and his resourcefulness to cope with its challenges. (p. 139)

Kaufman and Kaufman (2001) argued that emotional intelligence is related to general intelligence as Wechsler defined intelligence, and he would have wanted to measure emotional intelligence since the factor analysis of his tests almost never accounted for more than 60 percent of the accumulated variance. Kaufman and Kaufman argued that Wechsler assumed the unaccounted variance was due to non-intellectual factors of intelligence. In discussing the missing variance, Wechsler (1950) stated:

We already have some clues as to what the non-intellective but relevant factors of intelligence may be. What we now need are tests which not only identify but measure them. This in effect demands broadening our

concept of general intelligence and calls for a revised psychometric to measure these variables as sub-tests of all general intelligence scales. (p. 83)

Despite never directly addressing emotional intelligence, Kaufman and Kaufman (2001) argued Wechsler considered several aspects of emotional intelligence, specifically in the comprehension (conceptual social conventions, rules and expressions) and picture arrangement (nonverbal comprehension of social interaction and the ability to reason sequentially) subtests.

More recent work by Gardner (1983, 1993, 2006) and his theory of multiple intelligences has been widely cited as influential to the emotional intelligence research community (Bar-On, 2006; Goleman, 1995, 1998; Mayer & Salovey, 1997; Salovey & Mayer, 1990). Working with both normal and gifted children, Gardner was convinced the single view of one type of intelligence was flawed, which led to his theory of multiple intelligences that initially included seven types of intelligence, but has since grown to nine possible types of intelligence.

Gardner (2006) argued that intelligence in the traditional perspective simply measures one's ability to answer items on a test, and after a certain age does not change much—intelligence is more or less a natural attribute of an individual. To the contrary, multiple intelligences theory argues for an expansion of the traditional definition of intelligence. Gardner argued intelligence is “a computational capacity—a capacity to process a certain kind of information” (p. 14). Gardner suggested different cultural settings and communities present many types of information to solve problems, which one type of intelligence cannot account for.

One of the intelligences Gardner's (1993) theory proposed is personal intelligence. This type of intelligence is based on an individual's ability to process information about one's self and others. Personal intelligence can be further divided into interpersonal and intrapersonal intelligence. Interpersonal intelligence, Gardner argued, is a person's ability to understand other people, their motivations, and how they work with others. Individuals with high interpersonal intelligence commonly include those in professions such as sales, politics, and religion. They exhibit what could be generally classified as extrovert personalities. Intrapersonal intelligence has an inward focus on the individual and his/her understanding of personal feelings. Individuals with high intrapersonal intelligence have the ability to understand and discriminate amongst their emotions and use this information to guide their behavior. In essence, they have a sense of knowing themselves and use the information to make effective decisions.

In summary, the early research in intelligence provides an argument for the possibility that a single measure of intelligence may not be adequate in explaining an individual's abilities. Thorndike's (1920) early work may not have led to a new type of intelligence accepted by the scientific community, but his work did provide a pathway to a discussion for explaining why standard measures of intelligence do not always predict success in all aspects of life. Wechsler (1950) furthered the argument when he was unable to account for more than 60 percent of the accumulated variance in his intelligence tests; in effect he suggested something was missing. Gardner (1983, 1993, 2006) began to expand on the traditional view of intelligence, offering the theory that multiple intelligences exist to varying degrees in all individuals.

To define a new type of intelligence within psychology, four key issues must be addressed that include defining the intelligence, developing an instrument to measure the proposed intelligence, establishing independence from existing intelligences, and demonstrating the intelligence can predict criteria relevant to the real world (Mayer & Salovey, 1997). While the debate as to whether emotional intelligence constitutes a new type of intelligence continues, the academic literature appears to have accepted three main constructs each with a differing perspective on emotional intelligence.

**Theoretical constructs.** There is generally little debate amongst scholars related to the overall theory of emotional intelligence, which centers on emotional and cognitive abilities (Cherniss, 2001). However, significant debate does exist as to which definition and model best represents the concept, and the most effective way to measure emotional intelligence. Despite the lack of agreement with regard to a single definition of emotional intelligence, three constructs and four related instruments have evolved from the academic research (Spielberger, 2004). The constructs and instruments include the Bar-On model (1997), which utilizes the Emotional Quotient Inventory (EQ-i); the Goleman model (1998), which utilizes the Emotional Competence Inventory (ECI); and the Mayer and Salovey model (1997), which utilizes the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) and the Assessing Emotions Scale (Schutte, Malouff, & Bhullar, 2009).

The emotional intelligence research tends to divide the models into either trait-based constructs (Bar-On, 1997; Goleman, 1998), which are sometimes referred to as mixed models (Mayer, Caruso, & Salovey, 2000), or an ability-based construct (Mayer & Salovey, 1997). Emotional intelligence from a trait perspective focuses on

individual self-perception, typically assessed through the use of a self-evaluation; whereas the ability-based perspective is focused on emotional related cognitive abilities measured using a test based on performance (Petrides, Pita, & Kokkinaki, 2007).

Researchers have also further classified the trait-based emotional intelligence models as mixed models, arguing they have elements of other characteristics such as personality (Mayer et al., 2000). Some researchers dispute this argument, suggesting that all emotional intelligence constructs have an overlap with cognitive and personality elements (Bar-On, 2006). Each model warrants explanation and as such each is detailed hereto.

***Bar-On model of emotional intelligence.*** Although Thorndike (1920) and others (Gardner, 1983, 1993, 2006; Wechsler, 1939, 1950, 1975) built the foundation for emotional intelligence, Bar-On (1988) was one of the first to research what would eventually become known as emotional intelligence. Bar-On, in his dissertation research in the late 1980s, sought to better understand why some people experience higher levels of psychological well-being. He also wanted to better understand why many individuals with average intelligence succeed in life, while others with high intelligence sometimes fail. His research led to coining the term emotional quotient (EQ). Much like intelligence quotient (IQ), Bar-On argued, everyone has a level of emotional competence that includes inter and intra personal abilities that when combined with a set of certain skills and facilitators determines effective behavior (Bar-On, 2006). Because of the social elements in his construct, Bar-On preferred to describe his model as emotional-social intelligence (ESI). Bar-On defined ESI as, “a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how

effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands” (p. 14).

Because of the importance his model places on expressing emotions and the outcomes social and emotional behavior have on adaptation, Bar-On (2006) cited Darwin’s (1872) early work in the expression of emotion to the importance for survival and adaption as influential in the development of his model. Thorndike (1920) and his emphasis on social intelligence and the importance he believed it has on performance, in addition to Wechsler’s (1950) perspectives on the effect cognitive and non-cognitive factors, which he described as intelligent behavior, have also been influential to Bar-On’s model (Bar-On, 2006). Bar-On has also been influenced by Sifneos’ (1967) work with alexithymia, a disease in which individuals lack the ability to describe, understand, or process emotions (arguably the opposite of having a high EQ). A final influence Bar-On credited to contributing in his development of ESI is the work of Applebaum (1973) and the concept of psychological mindedness, which describes a person’s ability for self-evaluation.

Bar-On (2006) categorized ESI into five primary scales used to measure EQ. The five scales include (1) intrapersonal skills—being aware of one’s self and expressions; (2) interpersonal skills—having social awareness and the ability to manage relationships; (3) stress management—the ability to regulate and manage emotions; (4) adaptability—being able to deal effectively with change; and (5) general mood—having internal motivation. Each of the scales contains sub-scales consisting of key components and moderating variables. Figure 2 illustrates Bar-On’s model of ESI.

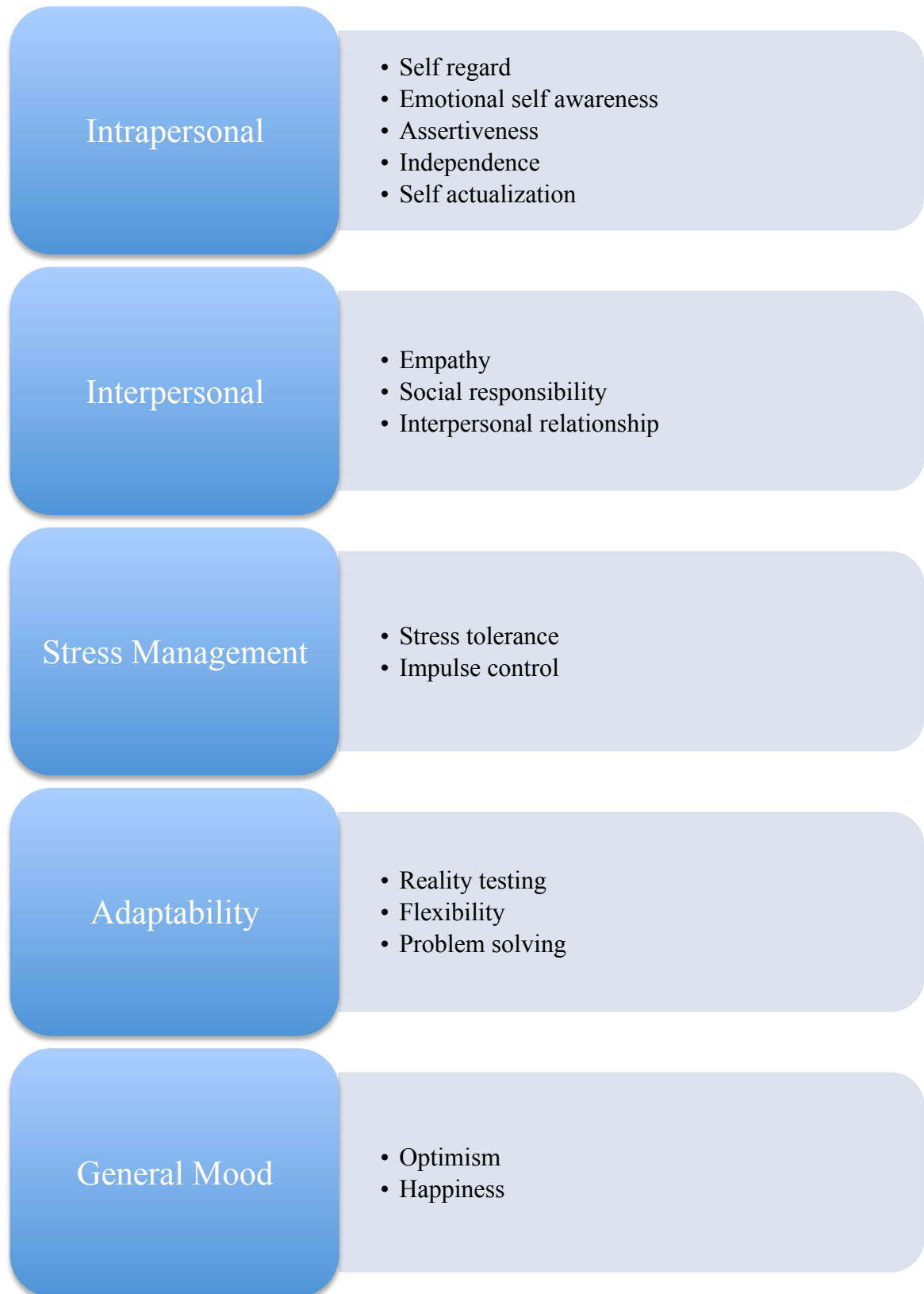


Figure 2. Bar-On model of ESI.

The intrapersonal scale consists of three key components. The components include (1) self regard—the ability to perceive, accept and understand oneself; (2) emotional self awareness—the ability to be aware of one’s emotions and understand them; and (3) assertiveness—the ability to express one’s emotions effectively and constructively (Bar-On, 2006). Two moderating variables, independence and self-actualization, are also included in the intrapersonal scale (Bar-On, 2006). Independence refers to a person’s ability to be free of emotional dependency and reliance on others, and self-actualization is described as the ability to realize one’s full potential (Bar-On, 2006).

Interpersonal scale key components include empathy—the ability to understand how others feel, and interpersonal relationship—the ability to create mutually beneficial relationships and work well with others (Bar-On, 2006). Social responsibility, being able to connect with one’s social group and cooperate with others, is a moderating variable to the interpersonal element of EQ (Bar-On, 2006). Stress management has two key components consisting of stress tolerance and impulse control (Bar-On, 2006). Stress tolerance can be described as the ability to manage emotions in stressful situations, and impulse control is described as the ability to control emotions in a stressful situation (Bar-On, 2006).

Dealing effectively with change, described by the adaptability scale, consists of three key subscales. The subscales include (1) reality testing—validating one’s emotions and thinking with the external world; (2) flexibility—being able to adjust and adapt thinking and emotions to changing situations; and (3) problem solving—having the ability to solve personal and relationship related issues (Bar-On, 2006). The final scale



describes elements of general mood. These elements include optimism—having a positive perspective on life, and happiness—a feeling of satisfaction with oneself, others, and one’s overall life situation (Bar-On, 2006).

The Bar-On (2006) model of ESI has been criticized as a true measure of intelligence by ability-based emotional intelligence researchers (Mayer et al., 2000). Mayer et al. (2000) argued models of emotional intelligence such as Bar-On’s include elements related to personality traits that cloud the ability to truly assess an individual’s emotional intelligence. The researchers described Bar-On’s construct of emotional intelligence as belonging to a group they label as “mixed models” (p. 397) because of the overlap these models have with personality traits. Mayer et al. (2000) argued, “Bar-On’s theoretical work combines what may possibly qualify as mental abilities (e.g., emotional self-awareness) with other characteristics that are considered separable from mental ability, such as personal independence, self-regard, and mood; this makes it a mixed model” (p. 402). Bar-On (2006) argued both his construct and the ability based construct of Mayer and Salovey (1997) have a certain degree of overlap with cognitive intelligence and personality tests ranging from 15 percent (MSCEIT) to 20 percent (EQ-i) (Bar-On, 2004; Van Rooy & Viswesvaran, 2004). With such a small difference between the model types Bar-On (2006) argued:

The “mixed” characteristic used by some (Mayer et al., 2000) to describe *some* of these models, exists in *all* such models and measures in that they all overlap with personality traits and cognitive intelligence to some extent, but the actual difference between them within this small degree of overlap does not justify using descriptors such as “mixed” versus

“abilities” as a meaningful way of categorizing these models and measures. (p. 18)

***Goleman model of emotional intelligence.*** Goleman (1995, 1998) is widely credited with bringing the concept of emotional intelligence to the broader business audience (Bar-On & Parker, 2000; Salovey, Mayer, & Caruso, 2002). After reading Salovey and Mayer’s (1990) seminal article, Goleman was influenced to explore the subject of emotional intelligence and emerged with a construct of his own. What is unique to Goleman’s research is his focus specifically on work performance (Emmerling & Goleman, 2003). Goleman (1998) defined emotional intelligence as “the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships” (p. 317).

Goleman’s (2006) theory of emotional intelligence is centered on what he described as emotional and social competency. An emotional competency is defined as “a learned capability based on emotional intelligence that results in outstanding performance at work” (Goleman, 1998, p. 24). Goleman argued that emotional intelligence provides a mechanism for determining an individual’s potential related to the key elements of the theory, but emotional and social competency demonstrate an individual’s application of the elements in a manner that relates to job capabilities. Goleman argued using an approach based on competency is rooted in the tradition that focuses on identifying competencies that can be utilized to predict an individual’s work performance in various types of organizational environments, typically those related to leadership roles (Emmerling & Goleman, 2003).

The theory of emotional intelligence Goleman initially developed has evolved with his research in the subject. Goleman's (1995) initial theory consisted of being emotionally self-aware, managing emotions, handling emotions effectively, having empathy, and dealing effectively with relationships. A few years later Goleman (1998) further refined his theory in what he described as the "emotional competence framework" (p. 26). The framework defines both social competencies—one's ability to deal effectively with relationships, and personal competencies—one's ability to manage themselves. Goleman formally defined two social competencies—empathy and social skills, and three personal competencies—self-awareness, self-regulation, and motivation. Goleman described these five as "dimensions of emotional intelligence" (p. 25), and also expanded on the dimensions using twenty-five specific competencies related to the dimensions.

In his most recent version of emotional intelligence, Goleman has further refined his model that now includes 18 competencies contained within four clusters (Wolff, 2005). Figure 3 illustrates Goleman's version of emotional intelligence.

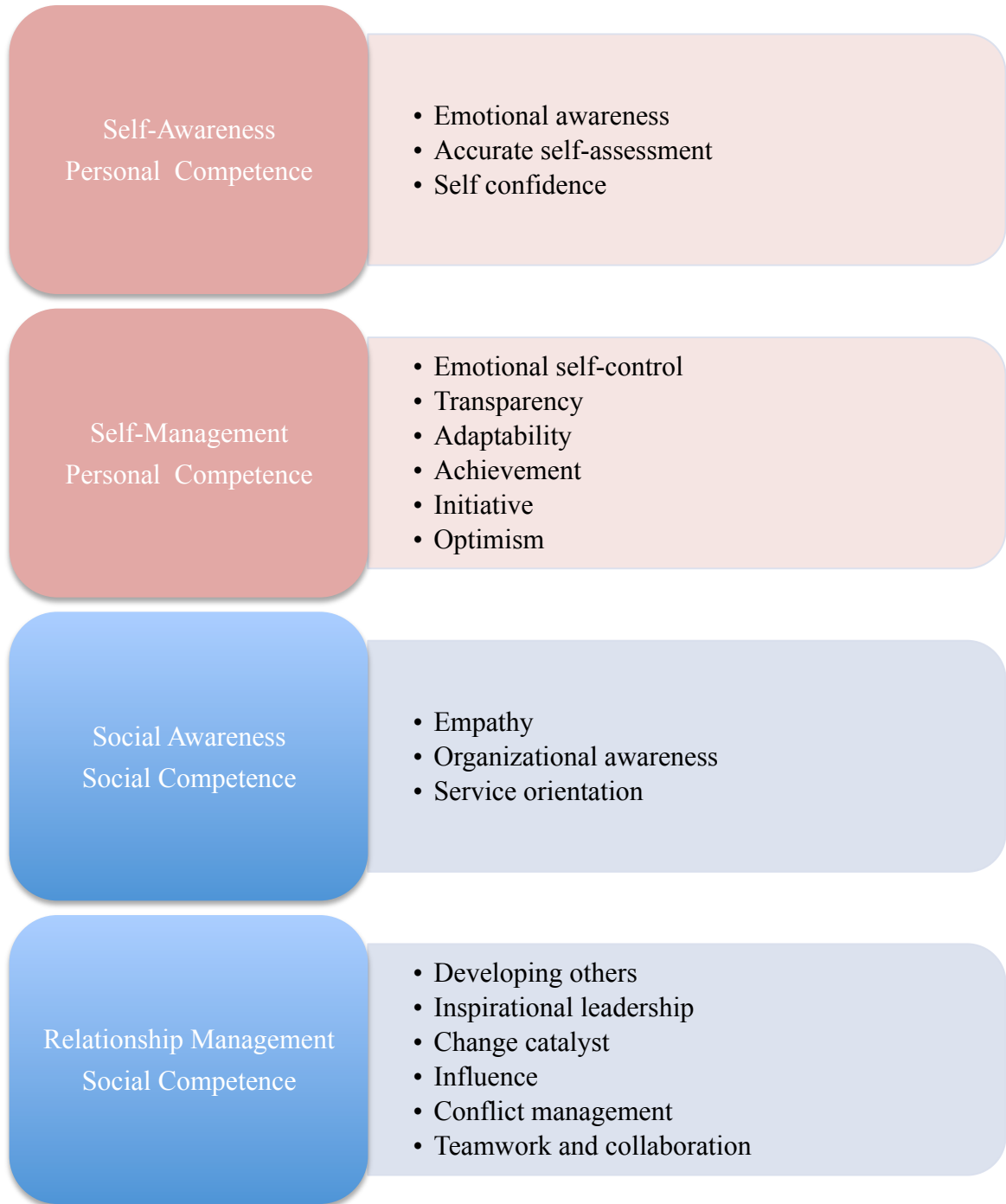


Figure 3. Goleman model of emotional intelligence.

The clusters maintain a division between personal and social competence.

*Personal competence* is divided into self-awareness—the ability to know one’s intuitions, preferences, resources, and internal states; and self-management—the ability to manage one’s resources, internal states, and impulses (Wolff, 2005). The self-awareness cluster contains three competencies that include (1) emotional awareness—being able to recognize one’s emotions and the effects they have; (2) accurate self-assessment—having the ability to know one’s weaknesses and strengths; and (3) self-confidence—knowing one’s capabilities and having a sense of self-worth (Wolff, 2005). The *self-management* cluster is composed of six competencies. The six competencies include (1) emotional self-control—the ability to keep impulses and disruptive emotions under control; (2) transparency—acting consistently with one’s values and maintaining integrity; (3) adaptability—having the ability to deal with change; (4) achievement—constantly focused on improvement and achieving high standards; (5) initiative—being proactive with new opportunities; and (6) optimism—pursuing goals with persistence even when faced with challenges and setbacks (Wolff, 2005).

The *social competence* clusters include social awareness—how an individual handles relationships and is cognizant of other’s concerns, needs, and feelings; and relationship management—one’s level of proficiency at creating desirable reaction from others (Wolff, 2005). The social awareness cluster is comprised of three competencies. The three include (1) empathy—having an active interest in other’s perspectives and feelings; (2) organizational awareness—being able to interpret a group’s relationships with

power and flow of emotions; and (3) service orientation—being able to anticipate, recognize, and meet a customer’s requirements (Wolff, 2005). The *relationship management* cluster consists of six competencies. The six include (1) developing others—assessing other’s abilities and development needs; (2) inspirational leadership—having the ability to inspire other groups and individuals; (3) change catalyst—being able to manage or initiate change; (4) influence—having the ability to effectively utilize tactics for persuasion; (5) conflict management—being able to work through disagreements and negotiate; and (6) teamwork and collaboration—having the ability to work well with others on common goals and create a sense of teamwork (Wolff, 2005).

Goleman’s model of emotional intelligence has many similarities with Bar-On’s (2006) construct (Wolff, 2005). What Bar-On describes as interpersonal and intrapersonal could be viewed in a similar perspective as Goleman’s personal and social competencies. Several additional similarities exist between the models that include many of the key components in Bar-On’s model and Goleman’s competencies. In light of their similarities, it is not surprising to find Goleman’s model also faced similar criticism from ability-based emotional intelligence researchers who argued the mixed models, like Goleman’s, have considerable overlap with personality measures (Mayer et al., 2000).

Goleman has also faced significant criticism for claims he has made in the predictive ability of emotional intelligence in work, home, and school related success (Mayer et al., 2000). Most of the criticism comes from Goleman’s claims comparing IQ to emotional intelligence. Goleman (1995) argued that while measures of IQ have been

in existence for nearly a century, and emotional intelligence is still a fairly new concept, the existing data (circa 1995) “suggest it [emotional intelligence] can be as powerful, and at times more powerful, than IQ” (p. 34). While other emotional intelligence researchers agreed with Goleman that IQ is attributable to around 20 percent of the elements that determine success in life, the criticism focused on the statement Goleman made regarding the remaining 80 percent. Goleman stated, “at best IQ accounts for 20 percent to the factors that determine life success, which leaves 80 percent to other forces” (p. 34). Combined with the aforementioned statement relating to how emotional intelligence can be more powerful than IQ, has led many to believe Goleman suggested the remaining 80 percent is attributable to emotional intelligence. Goleman (2006) addressed the misinterpretation stating:

It [remaining 80 percent] does *not* mean, however, that emotional intelligence represents the rest of the factors in success: they certainly include a very wide range of forces—from wealth and education of the family we are born into, to temperament, to blind luck and the like—in addition to emotional intelligence. (p. xiii–xiv)

Despite Goleman’s (1998) attempt to address the misconceptions related to his work, he continued to argue for the superior role emotional intelligence has over IQ, perhaps adding to the confusion and criticism, stating that, “IQ takes second position to emotional intelligence in determining outstanding job performance” (p. 5). He went on to state, “emotional intelligence counts more than IQ or expertise for determining who excels at a job—*any* job—and that for outstanding leadership it counts for almost everything” (p. 13). Without further explanation one may conclude Goleman suggested

someone with low IQ and high emotional intelligence can be successful, but he conceded a certain minimal set of mental competencies is required to get and hold a job, but having a superior IQ does not guarantee success (Emmerling & Goleman, 2003).

***Mayer and Salovey model of emotional intelligence.*** Despite acknowledging they were not the first to explore the concept of emotional intelligence (Mowrer, 1960; Payne, 1985), Salovey and Mayer (1990) are widely credited with coining the term “emotional intelligence” (p. 185). The researchers initially defined the concept as “the subset of social intelligence that involves 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).

In their seminal work, Salovey and Mayer (1990) explored the historical perspectives of emotion and intelligence. The authors argued there are differing views of emotion, some which suggest emotion is a disorganized disruption of mental thoughts and a loss of cerebral control (Young, 1936, 1943), and others that view emotions as orderly responses through the use of cognitive processes that result in some form of action (Easterbrook, 1959; Leeper, 1948). Salovey and Mayer offered their perspective on emotion, which they believed is an organized reaction that utilizes a variety of psychological subsystems that include cognitive, experiential, motivational, and physiological processes, and from this perspective believed emotion has the potential to create elevating experiences from both a personal and social viewpoint.

Salovey and Mayer (1990) explored the concept of intelligence to arguably a deeper level than Bar-On (2006) and Goleman (1995, 1998). The authors suggested emotional intelligence may not have correlations with other types of intelligences, but



what is more important is that emotional intelligence fits within the realm of the traditional intelligence definitions (Wechsler, 1958). Influenced by their view of intelligence as an ability, Salovey and Mayer proposed a concept for emotional intelligence that included three branches consisting of appraisal and expression of emotion, regulating emotion, and utilizing emotion. This early construct of Salovey and Mayer, which included elements of empathy, flexibility, creative thinking, and motivation, has similarities to the current mixed models.

In the follow up to their initial research, Mayer and Salovey (1997) expanded their thoughts on emotional intelligence and offered a refined definition. The researchers believed their initial perspective of emotional intelligence was too vague. They concluded the original definition only focused on perceiving and regulating emotions, and did not consider thinking about feelings. The revised definition Mayer and Salovey proposed states:

Emotional intelligence involves the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth. (p. 10)

Mayer and Salovey (1997) also proposed a new model illustrated in figure 4 that contains four branches of emotional intelligence, which noticeably excluded elements from their previous concept that had similar personality trait components found in the current mixed models. In establishing a basis for the development of an instrument to measure emotional intelligence, the authors argued research on elements related to

personality traits such as motivation and optimism provide little contribution to understanding emotion and intelligence. Mayer and Salovey also argued self-descriptions provide minimal use in demonstrating a concept such as emotional intelligence exists. The authors argued that asking people to solve a problem is a better method of assessing abilities, which provides a basis for their revised model of emotional intelligence.

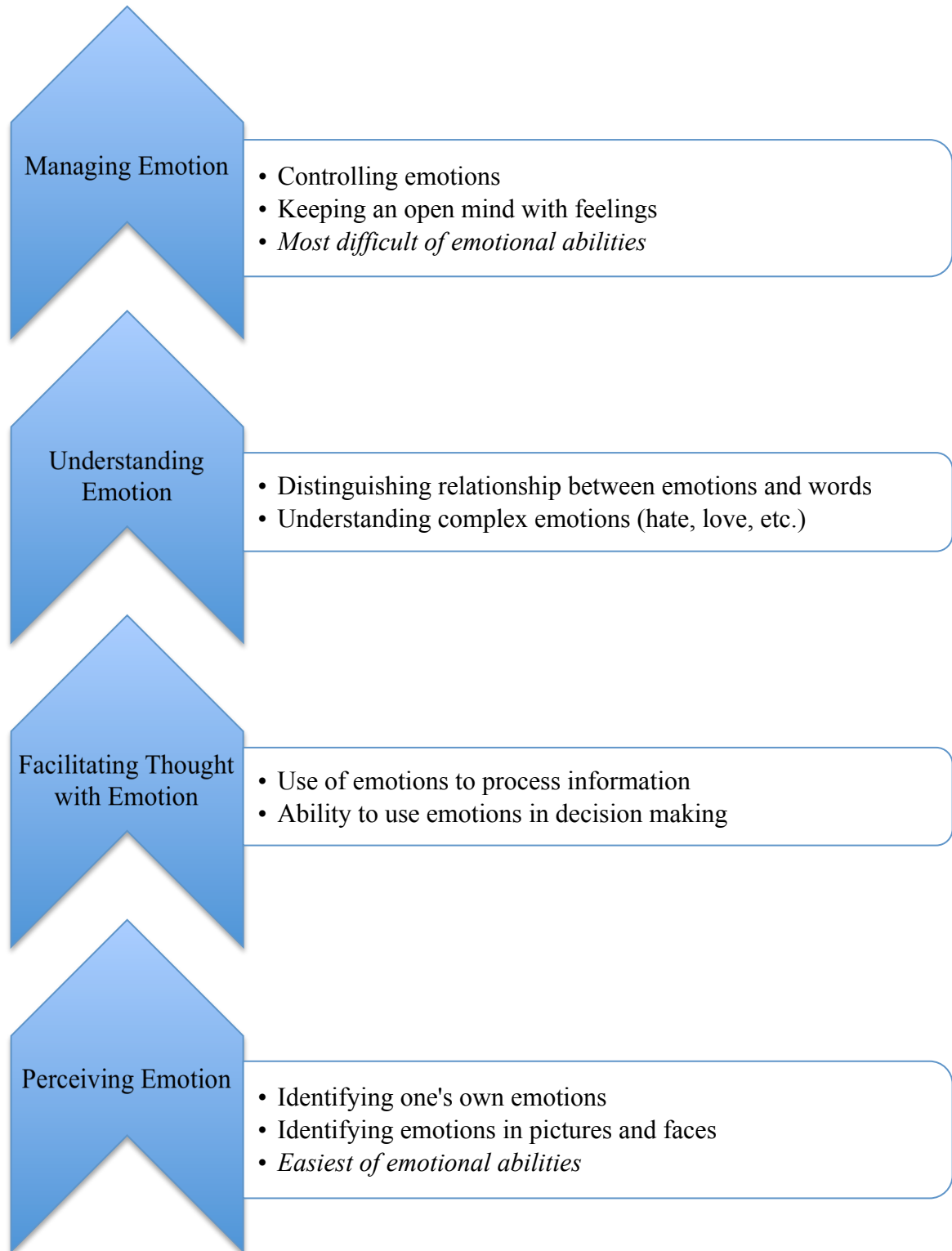


Figure 4. Mayer and Salovey model of emotional intelligence.

The four branches in Mayer and Salovey's (1997) revised model represent a hierarchy of abilities with the less difficult at the bottom and the more challenging at the top. The lowest branch of the model—perceiving, appraising, and expressing emotion—centers on an individual's ability to accurately identify emotions and their content. At this level an individual can identify their own emotions and the emotions of other individuals, photographs, artwork, etc. They also have the ability to identify emotions through sound, language, behaviors, and appearances, and are able to express emotions accurately, and have the ability to discriminate between true and untrue emotions.

Using emotions to facilitate thought is the second branch of the Mayer and Salovey (1997) model. This branch is described by an individual's ability to use emotions to assist thinking by focusing on important information and using emotions to help make judgments. They also have the ability to alter moods that lead to multiple perspectives on a situation or problem, and are able to use different moods to facilitate different methods of reasoning (deductive and inductive).

The third branch of Mayer and Salovey's (1997) model is based on the ability to understand and use emotional knowledge. This branch is based on an individual's ability to distinguish the relationships between emotions and words and by the ability to understand the relationship between the meaning of emotions and how they relate to relationships, such as a happy feeling during a new relationship. The ability to understand complex emotions such as hate and love, and the ability to recognize changes in emotions such as from anger to rage are also part of the third branch.

The fourth branch represents the highest level of abilities, which Mayer and Salovey (1997) described as reflective regulation of emotions to stimulate intellectual and emotional growth. To grow and learn, an individual must be able to keep an open mind with their feelings that may range from both ends of the spectrum. They must also have the ability to connect and disconnect with an emotion based on the value it provides in a given situation, and be able to monitor emotions in respect to one's self and others. A final element to the fourth branch is the ability to control emotions in one's self and others, moving away from negative emotions, and stimulating positive emotions.

The Mayer and Salovey (1997) model offers a unique perspective on emotional intelligence in comparison to the Bar-On (2006) and Goleman (1995, 1998) models. Where the other models have a greater focus on personal characteristics, the Mayer and Salovey model centers on abilities. The Mayer and Salovey model has also received significantly less criticism than the Bar-On and Goleman models and is considered to be more scientific because it ties closer to a true intelligence test instead of a self-evaluation (Spector, 2005). The assessment is also the only one that can be classified as a criterion report, which is considered the highest standard for psychometric testing (Mayer, 2007). Several researchers have also argued that the Mayer and Salovey model has the most promise for widespread acceptance in the academic community (Dasborough, 2007; Salovey & Grewal, 2005), and is the only valid model of emotional intelligence (Daus & Ashkanasy, 2005).

In summary, each of the three constructs has strengths and weaknesses. Table 2 summarizes definitions and key elements of each construct. Bar-On's (2006) emotional-social intelligence contains a fair amount of overlap with personality

measures, but has also been the most widely used instrument, suggesting it may be the most accepted by those researching emotional intelligence. The Goleman (1998) model is certainly the most criticized in the academic community stemming from the exaggerated claims he has made about the impact emotional intelligence has in the business world. Some of these claims should come as no surprise as Goleman spent more than a decade writing for *The New York Times*, which may have biased his style of writing from academia to popular press where extravagant claims sell newspapers and books. Despite Goleman's perceived exaggerations, he does deserve some credit for bringing the concept of emotional intelligence to the masses, which has no doubt spilled over into academia, influencing the volume of research that has evolved since his first two books were published in the mid to late 1990s. Mayer and Salovey (1997), taking a different approach than Bar-On and Goleman, have created an appealing construct the academic community appears to have wide support for. Despite some overlap with personality measures, their model stands out as unique from the others in testing for ability and not self or group evaluation. With over a century of research supporting cognitive intelligence theory, in comparison emotional intelligence is arguably still in a state of maturity. Decades of further research will likely need to be conducted before a true assessment of the value emotional intelligence has, or does not have, can be concluded.

Table 2

*Comparison of emotional intelligence constructs*

	Bar-On	Goleman	Mayer and Salovey
Definition	“a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands” (Bar-On, 2006, p. 14).	“the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships” (Goleman, 1998, p. 317).	“the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10).
Key Elements	<p><i>Intrapersonal</i></p> <ul style="list-style-type: none"> <li>-Self regard</li> <li>-Emotional self-awareness</li> <li>-Assertiveness</li> <li>-Independence</li> <li>-Self-actualization</li> </ul> <p><i>Interpersonal</i></p> <ul style="list-style-type: none"> <li>-Empathy</li> <li>-Social responsibility</li> <li>-Interpersonal relationship</li> </ul> <p><i>Stress management</i></p> <ul style="list-style-type: none"> <li>-Stress tolerance</li> <li>-Impulse control</li> </ul> <p><i>Adaptability</i></p> <ul style="list-style-type: none"> <li>-Reality testing</li> <li>-Flexibility</li> <li>-Problem solving</li> </ul> <p><i>General mood</i></p> <ul style="list-style-type: none"> <li>-Optimism</li> <li>-Happiness</li> </ul>	<p><i>Self-awareness</i></p> <ul style="list-style-type: none"> <li>-Emotional awareness</li> <li>-Accurate self-assessment</li> <li>-Self-confidence</li> </ul> <p><i>Self-management</i></p> <ul style="list-style-type: none"> <li>-Emotional self-control</li> <li>-Transparency</li> <li>-Adaptability</li> <li>-Achievement</li> <li>-Initiative</li> <li>-Optimism</li> </ul> <p><i>Social awareness</i></p> <ul style="list-style-type: none"> <li>-Empathy</li> <li>-Organizational</li> <li>-Awareness</li> <li>-Service orientation</li> </ul> <p><i>Relationship management</i></p> <ul style="list-style-type: none"> <li>-Developing others</li> <li>-Inspirational leadership</li> <li>-Change catalyst</li> <li>-Influence</li> <li>-Conflict management</li> <li>-Teamwork and collaboration</li> </ul>	<p><i>Managing emotion</i></p> <ul style="list-style-type: none"> <li>-Controlling emotions</li> <li>-Keeping an open mind with feelings</li> </ul> <p><i>Understanding emotion</i></p> <ul style="list-style-type: none"> <li>-Distinguishing relationship between emotions and words</li> <li>-Understanding complex emotions</li> </ul> <p><i>Facilitating thought with emotion</i></p> <ul style="list-style-type: none"> <li>-Use of emotions to process information</li> <li>-Ability to use emotions in decision making</li> </ul> <p><i>Perceiving emotion</i></p> <ul style="list-style-type: none"> <li>-Identifying one's own emotions</li> <li>-Identifying emotions in pictures and faces</li> </ul>

**Measures of emotional intelligence.** Several instruments have been developed to measure emotional intelligence, but only a few have received attention from the scientific community. Schutte et al. (1998) developed what has evolved into the Assessing Emotions Scale, Bar-On (2006) created the Emotional Quotient Inventory (EQ-i), Goleman played a key role in designing the Emotional Competence Inventory (ECI), which is based on his model of emotional intelligence (Wolff, 2005), while Mayer, Caruso, and Salovey (1999) initially created the Multifactor Emotional Intelligence Scale (MEIS), which they eventually improved upon with the development of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Mayer, Salovey, Caruso, & Sitarenios, 2003).

***The Assessing Emotions Scale.*** Schutte et al. (1998) developed an instrument based on the original emotional intelligence construct proposed by Salovey and Mayer (1990). The instrument is based on the four original branches that include (1) appraisal of emotion in one's self and others, (2) expressing emotions, (3) regulating emotions of one's self and others, and (4) using emotions to resolve problems. Although the Salovey and Mayer construct is considered an ability-based model, Schutte et al. considered their instrument to be focused on assessing traits or characteristics.

The instrument has been identified in various forms that include the Emotional Intelligence Scale, the Self-Report Emotional Intelligence Test, the Schutte Emotional Intelligence Scale, and most recently as the Assessing Emotions Scale (Schutte et al., 2009). The instrument consists of 33 questions that are measures of individual characteristics. A five-point scale is used to answer each question, and the summation of the individual question scores equals the level of emotional intelligence in the individual



taking the assessment. Sub scores are also generated for each of the four branches previously discussed.

Schutte et al. (1998) reported the internal consistency of the instrument is .90, and the subscales range from .55 to .80. The researchers stated the test–retest reliability as .78. The validity of the instrument has been analyzed through comparison with the EQ–i and MSCEIT in which Brackett and Mayer (2003) reported a correlation of .43 and .18, respectively. Both correlations were statistically significant, however, the MSCEIT had a much weaker correlation with the instrument, suggesting the scale is most similar to the EQ–i. Brackett and Mayer also tested the relationship between the Assessing Emotions Scale and the Big Five Personality measures, and found correlations with openness had the strongest relationship ( $r = .47$ ), albeit relatively weak, having a shared variance of 22 percent. Research comparing men and women has had mixed results with some reporting women having statistically significant higher scores than men, and others having no significance.

***The Bar–On Emotional Quotient Inventory (EQ–i).*** The Bar–On (2006) EQ–i is a self–report measure of ESI consisting of 133 questions. The questions are presented in the form of short sentences that individuals respond to using a five point scale ranging from “not true of me or very seldom” to “true of me or very often true of me”. An EQ score is calculated based on the respondent’s overall ESI, and individual scores are reported for the aforementioned 15 subscales. The raw scores are converted into a standard score based on an average of 100 and a standard deviation of 15. Bar–On argued that the higher the EQ score the more likely the individual will be successful in meeting daily challenges. The EQ–i also has a correction factor built into the instrument,

which is based on the validity indices described as positive and negative impressions. The factor is designed to reduce the potential for distorting effects of response bias, adding to the accuracy of the score (Bar-On, 2006).

The results of the instrument suggested older individuals score higher than younger, and no difference exists between ethnic groups (Bar-On, 2006). The data also suggested males are more able to manage emotions than women, but women are more aware of their emotions (Bar-On, 2006). Several levels of factor analysis have been conducted on the EQ-i resulting in the 10 key factors and five facilitators previously discussed, which are predictors of behavior that is socially and emotionally intelligent (Bar-On, 2006). The overall internal consistency of the EQ-i was .97, and the six-month retest reliability ranged from .72 for men and .80 for women (Bar-On, 2006).

To demonstrate construct validity, the EQ-i has been shown to have minimal overlap with cognitive intelligence, suggesting the two are likely separate constructs (Bar-On, 2004; Van Rooy & Viswesvaran, 2004). Disagreement exists between researchers in relation to the EQ-i and the amount of overlap the instrument has with personality trait measures such as the Big Five. Bar-On (2006) argued, based on data from research conducted by Van Rooy and Viswesvaran (2004), the overlap does not exceed 15 percent, but other researchers suggested the overlap is much higher (Brackett & Mayer, 2003; Dawda & Hart, 2000). This suggests what the EQ-i measures may not be different from the Big Five instrument. Bar-On (2003, 2004) argued his research has shown an increase in ESI is possible in a few weeks after completing training, which is something not typical for personality traits.

*The Emotional Competence Inventory (ECI).* The Emotional Competence Inventory (ECI) instrument was designed to be utilized as a 360-degree assessment (the ECI can also be used as a self-assessment) to measure the emotional competencies of organizations and individuals related to the Goleman (1998) model of emotional intelligence (Wolff, 2005). There are four levels within each of the 18 competencies, each of which is assessed with a unique question for a total of 72 questions. Evaluation is based on a five-point scale used to rate the frequency of the assessed behavior from never observed to consistently observed. A proprietary algorithm is used to score the assessment, and a trained facilitator provides an interpretation of the results. There is believed to be an optimal level of competency for a given role within an organization, which suggests having too much competency can be as much a problem as not having enough (Wolff, 2005). This belief suggests that higher scores will not always lead to increased performance. The ECI is unique from other measures of emotional intelligence because of the 360 degree assessment format, which is argued to provide a more reliable and valid measure of emotional intelligence (Wolff, 2005), although other researchers have argued only an individual knows their true emotional intelligence, and self-measures should be the preferred method of assessment (Harms & Crede, 2010).

In comparison to other emotional intelligence instruments, the ECI has far less statistical support (Fernandez-Berrocal & Extremera, 2006), which has led some critics to argue the instrument does not deserve serious attention (Conte, 2005). The reliability of the ECI has been evaluated from both individual and 360-degree assessments. The internal consistency of the self-rated assessment ranged from .47 to .87 (Byrne, Dominick, Smither, & Reilly, 2007; Wolff, 2005), and the 360-degree consistencies

ranged from .68 to .87 (Wolff, 2005). Retest reliability has not been formally conducted with the ECI (Wolff, 2005). Confirmatory factor analysis completed by Manuel, Serlavos and Boyatzis (2005) and also by Byrne et al. (2007) demonstrated a good fit of the four-cluster model.

Conte (2005) argued that few independent peer reviewed studies have examined the reliability and validity of the ECI. Byrne et al. (2007), partially in response to Conte, studied the discriminant, convergent, and criterion validity of the self-rated ECI. The researchers found correlations to the Big Five personality traits and little correlation to academic performance, thus providing minimal argument for discriminant validity from personality measures. The researchers also found a slight correlation between self-ratings and judges' ratings, providing a weak argument for convergent validity. A final discovery included a positive, but small correlation to work related metrics, suggesting weak criterion validity. Byrne et al. concluded their research by suggesting the results will neither satisfy the critics or proponents of the Goleman construct of emotional intelligence.

***The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).*** The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) is a 141 item assessment that uses a combination of questions and images to determine emotional intelligence of individuals. The MSCEIT measures emotional intelligence in the four branches that include perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing emotions (Mayer et al., 2003). Each of the four branches is measured using two methods. Pictures and faces are used to measure perceiving emotions; facilitation and sensation tasks are used to measure facilitating thought; change

and blend tasks are used to measure understanding emotions; and emotional relationships and emotion management tasks are used to measure managing emotions.

The MSCEIT provides 15 scores that include total emotional intelligence, area scores for strategic and experiential, four scores in each of the branches, and eight task scores (two for each branch). The MSCEIT has two scoring options—general and expert consensus. The general consensus scoring method measures the respondent's choice against the proportion of the sample that selected the same answer. For example, if a respondent selects answer three to a question related to the emotion on the face of a person whose picture is shown, based on a five point scale ranging from one—no happiness to five—extreme happiness, and 60 percent of the sample had the same answer, the individual's score would be incremented .60. Using the general consensus scoring methodology, the summation of all increments equals the respondent's scores in each of the respective 15 elements. The expert scoring methodology uses a similar proportional measure based on the responses of an expert group. Mayer et al. (2003) reported a high correlation, ( $r = .91$ ), between the general and expert consensus groups. Mayer et al. argued their research suggests experts are more reliable judges, and may prove to be the preferred method of scoring with further research to confirm their belief.

Mayer et al. (2003) reported the MSCEIT has a reliability of .91 for expert scoring and .93 for general scoring of overall emotional intelligence. The experiential and strategic area internal consistency was .88 and .86 for expert scoring, and .90 and .90 for general scoring, respectively. The branch scores had internal consistencies ranging from .76 to .91 for both scoring types, and the individual scores had internal consistencies ranging from .55 to .88. Mayer et al. suggested, due to the lower internal consistencies of

the individual scores, they should be interpreted with caution, and focus should be directed on scores at the total, area, and branch levels. Factor analysis provided support for one, two, and four factor models, which Mayer et al. argued supports the emotional intelligence construct measured by the MSCEIT. Retest reliability after two weeks has been reported as ( $r = .86$ ) (Brackett & Mayer, 2001).

Unlike the Bar-On (2006) EQ-i, the MSCEIT has demonstrated significant differences between emotional intelligence in men and women, with women scoring higher than men (Brackett & Mayer, 2003). The MSCEIT also has less overlap with the Big Five personality measures, which Brackett and Mayer (2003) argued is support for their belief the MSCEIT is measuring something distinct from personality. The overlap between the EQ-i and the MSCEIT has been reported to range from four percent (Brackett & Mayer, 2003) to 13 percent (Mayer et al., 2000), suggesting the two instruments are measuring something different. Critics of the MSCEIT argued the instrument has several weaknesses such as a lack of scientific standards for establishing the accuracy of expert and consensus scores, and the method of selecting “experts” to determine correct answers (Matthews, Zeidner, & Roberts, 2002). However, the ability-based measures of emotional intelligence appear to have a wider belief this type of measure is more likely to prevail as an accepted means of assessing emotional intelligence, primarily due to the discriminant validity from the Big Five personality measures (Conte, 2005; Dasborough, 2007; Daus & Ashkanasy, 2005; Salovey & Grewal, 2005).

**Emotional intelligence and work performance.** In the two decades since emotional intelligence was introduced to the academic (Salovey & Mayer, 1990) and

business (Goleman, 1995) communities, the volume of empirical research studying the concept's relationship to performance in a variety of areas has begun to develop. The research suggests emotional intelligence has a positive relationship with physical health (Bar-On, 2004; Krivoy, Weyl Ben-Arush, & Bar-On, 2000), educational performance (Bar-On, 1997, 2003; Parker et al., 2004), and work performance (Bar-On, 1997, 2004; Lopes et al., 2006). Two recent meta-analysis studies have also been conducted that offer a holistic point of view on emotional intelligence and performance from a broad perspective (Van Rooy & Viswesvaran, 2004) and from a viewpoint focused on leadership (Harms & Crede, 2010).

Van Rooy and Viswesvaran (2004) conducted the first meta-analysis on emotional intelligence research seeking to better understand the influence emotional intelligence has on performance, and the relationship emotional intelligence has with general mental ability (GMA) and the Big Five personality traits. The researchers studied the results of 69 independent studies with 12,666 participants obtained from both published and unpublished sources. The studies used a variety of emotional intelligence measures. The three most common instruments were the EQ-i (Bar-On, 2006), Emotional Intelligence Test (Schutte et al., 1998), and Multifactor Emotional Intelligence Scale (MEIS) (Mayer, Caruso, & Salovey, 1999), the predecessor to the MSCEIT. Van Rooy and Viswesvaran also divided the studies based on the method of measurement used, which included self-assessment (i.e. EQ-i, MEIS) and other evaluators (i.e. ECI). The researchers also segregated the research using the scoring of the assessment into either an expert or consensus rated group. A final segregation of the studies divided the

research into those using objective records of performance from those using subjective data.

Van Rooy and Viswesvaran (2004) found that while it varies by situation, emotional intelligence measures have validity in more than 90 percent of the situations, suggesting there is a link to performance. The researchers also discovered emotional intelligence measures predict performance in work and life situations, but not as much in academic settings, and all measures of emotional intelligence offer predictive validity. They also argued there is support for the differential validity between most of the elements of emotional intelligence in the Bar-On (2006) and Mayer & Salovey (1997) constructs, and expert rated self-assessments have higher validity than consensus rated, although not all research studies stated the method of scoring. The use of ratings from supervisors, self, and peers, concluded the researchers, had a higher validity than organizational records, and correlations between the ability based measures of emotional intelligence (MEIS) were much higher to GMA than the other measures. A final finding is that emotional intelligence adds incremental validity over the Big Five personality measures. Based on their analysis, Van Rooy and Viswesvaran argued for emotional intelligence as a valuable predictor of performance. The researchers also concluded the correlation to personality measures appears to be higher than what has previously been reported, although emotional intelligence may be a better predictor of performance, which Van Rooy and Viswesvaran's research concluded is five percent for work performance. While five percent may seem insignificant, the researchers argued in the overall realm of business results such a small percentage could have a major impact on organizational performance.



**Emotional intelligence and leadership performance.** In a more recent meta-analysis Harms and Crede (2010) focused on emotional intelligence and transformational leadership. The concept of transformational leadership was initially proposed by Burns (1978), and has since gained widespread popularity, primarily due to the work of Bass (1985) in expanding upon Burns' theory. Transformational leaders can be described as those who work with followers in their development through mentoring and coaching activities to help them reach their true capability. This type of leader can be thought of as a source of motivation and inspiration to their followers. A deep sense of trust, respect, and loyalty are also characteristics of followers to such a leader. Transformational leadership consists of four dimensions that include (1) intellectual stimulation, (2) inspirational motivation, (3) individualized consideration, and (4) idealized influence (Bass, 1985). Intellectual stimulation refers to a leaders' ability to take risks, challenge the status quo, and ask followers for their ideas. Inspirational motivation is based on the vision a leader develops in pursuit of gaining follower support, and setting challenging goals they inspire their followers to achieve. Individualized consideration is how well a leader empathizes with their followers and tends to their needs. Idealized influence can also be described as charisma, which leads to modeling the behavior a leader expects of their followers. With many similarities between the characteristics of transformational leaders and emotional intelligence (empathy, inter and intrapersonal skills, self-awareness, etc.), many researchers have argued a relationship between the concepts likely exists (Daus & Ashkanasy, 2005; George, 2000).

Harms and Crede (2010) explored the hypothesis that emotional intelligence has a positive relationship to transformational leadership by combining the research of 62

independent studies with 7,145 participants from published and unpublished sources. Five different measures of emotional intelligent measures were used in the studies. The top three measures included the MSCEIT (Mayer et al., 2003), Wong and Law's Emotional Intelligence Scale (Wong & Law, 2002), and EQ-i (Bar-On, 2006). The two most widely used measures of transformational leadership were the Multifactor Leadership Questionnaire (Bass & Avolio, 1997) and the Leadership Practices Inventory (Kouzes & Posner, 2007). The research studies had a combination of both self-rated (most common) emotional intelligence and leadership abilities and subordinate or peer rated abilities. The results suggested there is a significant difference in the comparison between the self and others rated emotional intelligence and leadership traits. Leaders who rated themselves in both concepts had a much higher correlation between emotional intelligence and leadership abilities, although overall correlation between the two concepts, when combining both assessment types, demonstrates a moderately strong correlation. In comparing the ability and trait-based measures of emotional intelligence, both had lower validity measures when others conducted the assessments. The relationship between the trait-based measures showed strong correlations with transformational leadership abilities, while the MSCEIT had a weak correlation. Harms and Crede also studied the relationships based on the rank of the individual being studied (manager versus non-manager) and found minimal differences in validity measures.

Harms and Crede (2010) argued, the overall results of the meta-analysis suggested the relationship between the concepts may be overstated. Emotional intelligence may contribute to leadership to some degree, but more research and refinement of the measuring instruments needs to take place before practitioners can

utilize such instruments to predict management performance. Harms and Crede stated that, “EI assessment devices be limited to usage for encouraging self-awareness and self-reflection in managers until better EI measures can be developed and validated” (p. 13). The researchers also suggested emotional intelligence may be better suited to self-evaluation since only an individual knows his/her own true feelings, however, the evaluation of transformational leadership characteristics, which are primarily visible to others though observation, may be best suited to others rating a leader’s ability.

Summarizing the research on emotional intelligence and performance, one cannot conclude a strong relationship exists at this point in time, but with further research and refinement of the constructs the potential exists to bring the two closer together. Early indications may point to a fractional improvement in performance, but even fractions gained can equate to significant positive changes in organizational performance. Through a constant cycle of research, understanding, and modification of the existing theory early indications suggest a need to pursue the relationship between individual and leadership performance and emotional intelligence is a worthy endeavor.

**Controversy with emotional intelligence.** With the concept of emotional intelligence still in a state of maturity, it should come as no surprise the theory has been criticized by a number of researchers. A few common themes have developed with the critics of emotional intelligence that include the concepts’ arguable similarities to personality traits, the lack of a clear measurement rubric, a failure to meet psychometric standards, extraordinary claims of performance improvements, and the ability to “fake” emotional intelligence on some assessment instruments (Conte, 2005; Day & Carroll, 2008; Landy, 2005; Locke, 2005).

Many of the critics of emotional intelligence have directed their criticism at the Goleman (1998) and Bar-On (2006) models. Landy (2005) criticized Goleman's work suggesting his research has not been peer reviewed and the data obtained using the ECI instrument used to measure his construct have not been openly shared with fellow researchers, making the extraordinary performance claims Goleman suggests are possible through improving emotional intelligence questionable. Conte (2005) offered a similar perspective on Goleman's work arguing little peer evaluation has been done on the ECI and minimal predictive and discriminant validity evidence has been provided, leading him to conclude the instrument does not deserve serious consideration. Daus and Ashkanasy (2005) have even gone so far as to suggest the Goleman and Bar-On models have done more harm than good in helping to establish emotional intelligence as a legitimate concept with the potential for incremental validity.

Faking emotional intelligence, another concern with some instruments, has also been studied recently by Day and Carroll (2008), creating an argument that an individual can give the impression of having high emotional intelligence when motivated to do so. Day and Carroll compared the EQ-i with the MSCEIT in which two groups of participants were first asked to respond as if they were applying for a job. Two weeks later the participants were asked to take both assessments again and answer honestly. The researchers discovered participants were able to significantly increase their score on the EQ-i, but not on the MSCEIT. This research suggested the EQ-i is more vulnerable to deception than the MSCEIT.

A lack of consistency between measures has also been a criticism of emotional intelligence instruments (Matthews et al., 2002). In comparing the MSCEIT and the

EQ-i, the amount of overlap has been reported to range from four (Brackett & Mayer, 2003) to 13 (Mayer et al., 2000) percent, suggesting the two are measuring different constructs. Another criticism focused on the trait-based instruments is their overlap with personality measures such as the Big Five. Bar-On (2006) conceded the EQ-i does in fact overlap to some degree with the Big Five, but argued this is also true of the MSCEIT, although to a much lower degree (Brackett & Mayer, 2003). Byrne et al. (2007) also found small to moderate positive correlations between the ECI and Big Five, bringing into question the discriminant validity of the instrument.

Although the ability-based model of Mayer and Salovey (1997) has received less negative attention, their construct has not escaped criticism. Conte (2005) is critical of the low reliability in the subscale scores of the MEIS instrument, which Mayer and Salovey appear to have addressed in the development of the MSCEIT (Mayer et al., 2003). The scoring methodology of the MSCEIT has also come under scrutiny by Matthews et al. (2002), who argued there is an absence of standards for establishing the accuracy of the consensus and expert scoring rubric, and the method of selecting those deemed as “experts”.

The debate amongst the proponents and critics of emotional intelligence could be viewed as a weakness within the field of research, but a counter argument suggests the activity is an indication of development and robustness surrounding the topic. The early indications hint there is potential for further research in studying the relationship between emotional intelligence and both organizational and individual performance. The research also suggests emotional intelligence, unlike cognitive intelligence, may be malleable,

thereby providing practitioners the possibility of staging interventions to improve emotional intelligence.

### **Work Engagement**

There is little doubt the demand on organizations to compete on a global scale requires more than a focus on process improvement through the use of techniques and concepts such as TQM and Lean Six Sigma. Arguably, the emotional intelligence of those tasked with implementing and executing improvement strategies may also factor into the probability of success. However, the combination of solid improvement strategy and execution coupled with high emotional intelligence may not be sufficient to succeed. The level of engagement by those involved in the efforts may also play into whether or not an organization is successful in utilizing TQM and Lean Six Sigma to drive improvement efforts.

The concept of work engagement has received significant attention in the past decade as organizational leaders seek ways in which to fully capture the potential of their workforce. Technology has supplied a significant portion to improvements in employee productivity in recent years, taking some of the human element out of work, but individuals are still the primary resource driving business performance. While improved technology can be purchased as scientific advancements develop year after year, improving the people utilizing the technology and the environment in which they coexist is not as straightforward. Understanding how to harness individual capabilities that not only result in a positive return to businesses, but also captures the passion, creativity, and commitment of employees has in part fueled much of the research related to work

engagement. Some of the questions driving the research focus on understanding what conditions need to exist in a work environment that lead to engagement, the role organizational players (managers, colleagues, etc.) have in creating engagement, and whether financial incentives lead to increased engagement. Much of the attention has come from data consulting organizations have compiled, which suggests less than a third of employees are truly engaged in their work (Towers Perrin, 2003, 2007; Wagner & Harter, 2006). Data in support of business outcomes being related to employee satisfaction and engagement provides an additional argument further study is a worthy endeavor (Harter et al., 2002).

**Historical underpinnings.** To fully understand the evolution of the modern concept of work engagement, a review of the significant developments in organizational theory is helpful. An argument could be made that one of the reasons so few individuals are engaged in their work today is rooted in many organizations continuing to take a scientific management approach to organizational management. Taylor (1916) developed the concept of scientific management in the early 1900s, and is credited for making significant improvements in worker productivity. His theory of scientific management consisted of gathering knowledge about the work (time and motion studies), selecting the best worker for the job, bringing the science and worker together through incentives to encourage the worker to follow the scientific management principles, and dividing work into management and worker tasks. Scientific management provided the influence to the metaphor of viewing organizations as machines (Morgan, 2006) in which workers are perceived as merely cogs in the organizational flywheel. There is no doubt Taylor's work led to increases in organizational performance and worker compensation, but it

lacked capturing anything beyond the physical abilities of the worker. The narrow view of the worker in an organization gave impetus to the human resource movement.

Shafritz, Ott, and Jang (2005) described human resource theory as management having a genuine interest for and concern in the behavior of individuals in an organization. Bolman and Deal (1997) argued the theory is built on the premise that organizations should be designed to serve individual needs because organizations and individuals need one another. The theory also suggests when a good fit between organizations and individuals exist both prosper, but if a poor fit exists one or both will suffer. The Hawthorne experiments are perhaps the most recognized research linked to the human resource theory. Completed from 1927–1932 at the Western Electric Hawthorne plant in Illinois, researchers conducted several studies. In one of the experiments the researchers studied the effects of illumination on productivity and were surprised to discover that regardless of the illumination level, productivity went up in both the test and control groups (Roethlisberger, 1941). By simply providing attention to the workers and consulting with them on changes, increases in productivity occurred even when their suggestions were not used.

During this same era Maslow (1943) was developing his theory of human motivation. Maslow's theory argued that an individual has an increasing level of need, a hierarchy, that develops as needs are met. The needs, Maslow argued, begin with physiological requirements to sustain basic life functions (food, clothing, shelter, etc.) before progressing to safety needs providing a sense of security. From a feeling of security, argued Maslow, individuals have a need for love and belonging, or social need. With social needs fulfilled, a need for esteem from achievement and recognition develops



before reaching the top of the hierarchy and self-actualization, or becoming all that one is capable of achieving.

McGregor (1957) was also influential to modern work engagement theory. His two theories, Theory X and Y, have links to Taylor's (1916) mechanistic perspective and the current engagement viewpoint, respectively. Theory X, McGregor argued, places management in a position centered on controlling, rewarding, and punishing, whereas Theory Y takes an alternative view of human motivation focused on helping individuals self actualize.

In summary, although the use of the term "engagement" was absent from the work of early organizational theorists, what is clearly evident from their research is the focus on individuals and their need for attention in the process of fully realizing both the individual's and organization's potential. Even though several decades would pass before the term engagement would enter the realm of academic research (Kahn, 1990), an argument could be made the concept was beginning to develop with research done in the Hawthorne experiments and in the thoughts of individuals such as Maslow and McGregor.

**Theoretical constructs and instruments.** In the world of academic research the concept of engagement is widely credited to have originated from the seminal work of Kahn (1990) who conducted research in the early 1990s in which he studied camp counselors and architectural firm employees (Rothbard, 2001; Schaufeli & Bakker, 2010). While the concept has received more attention from academia in recent years, much of the interest has come from the business world, stemming from the work of various consulting organizations linking the concept to the potential impact on business

performance (Buckingham & Coffman, 1999; Harter et al., 2002; Towers Perrin, 2003, 2007). Several varieties of engagement have also developed in both the business consultancy world and academia. The most common concept in the business world has been described as “employee engagement”, a term coined by the Gallup Organization (Buckingham & Coffman, 1999). In academia the concept of “work engagement” has recently received significant attention (Bakker & Leiter, 2010a). As with any emerging body of research, the popularity of engagement has resulted in a multitude of researchers proposing various definitions, constructs, and related instruments to further develop the understanding of engagement, potential factors related to the concept, and the potential impact to organizational performance.

***Kahn model of engagement.*** In his seminal work involving camp counselors and architectural firm employees, Kahn (1990) theorized individuals move in and out of states of involvement with their work as the day progresses. Kahn based his research on Goffman’s (1961) work related to the attachments individuals fade in and out of during social situations. Unlike Goffman’s research that focused on short encounters between individuals, Kahn argued a different approach needed to be taken for organizational life in which interaction between individuals is ongoing and more complicated from an emotional and psychological perspective. Through observation and interviews with his research participants, Kahn began to develop his theory of engagement. In describing their experiences of being absorbed in a situation, or at the opposite end of the spectrum when they were uninvolved in their work, Kahn’s research participants began to help him establish a theory focused on situations they move in and out of that require physical, cognitive, and emotional attention.

Kahn (1990) conceptualized the in and out relationship his participants described as personal engagement and personal disengagement. Personal engagement is defined as, “the harnessing of organization members’ selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (p. 694). Kahn defined personal disengagement as, “the uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, and emotionally during role performances” (p. 694). Kahn argued individuals move back and forth between states of engagement and disengagement based on a number of psychological conditions.

In describing situations in which they were engaged, Kahn’s (1990) research participants depicted three key themes that included meaningful work, safety, and availability. Meaningfulness is characterized in doing work that has a return on investment to an individual. Doing meaningful work creates a sense of worth in the individual and helps provide a feeling of satisfaction that the work they are doing is valued. Kahn described three influences to creating meaningfulness that include tasks, roles, and work interactions. To create meaningful tasks, the work needs to be challenging, offer variety, as well as the ability to work autonomously. Safety, argued Kahn, comes from individuals feeling they can express themselves freely without being perceived in a negative fashion. When individuals are not afraid to take chances without the fear of being ridiculed for failure, Kahn suggested they will become more engaged in their work. The key influences to creating a safe environment revolve around relationships with others in the workplace. Kahn argued interpersonal relationships that offer trust, support, and a lack of threat will help in developing a safe atmosphere. Kahn

also suggested that leadership plays a key role in creating safety through supporting behaviors that are consistent and demonstrate competency. Organizational culture also plays a pivotal role in helping to establish a safe environment. The final condition is availability, which refers to an individual's ability to invest psychologically, physically, and emotionally in a role. This creates a situation in which minimal external distractions interfere with the individual, and they are able to devote physical and emotional energy into a role in which they feel secure about their abilities to perform. To summarize, Kahn's model suggests engagement is influenced by individual, group, and leadership factors that lead to individual meaningfulness and a sense of security that they have the availability to invest in.

*Measuring engagement using the Kahn model.*

Kahn (1990) has not developed an instrument to measure his model of engagement, but his work influenced May, Gilson, and Harter (2004) to develop an instrument that includes various aspects of the Kahn model. May et al. assessed psychological engagement based on Kahn's elements of cognitive, emotional and physical characteristics. Cognitive questions focus on how absorbed one is in their job, emotional questions center on the level of passion one has for their work, and physical engagement is focused on the amount of energy invested into work. The factor analysis conducted by May et al. suggested the model only has one factor (psychological meaningfulness) and not three, and the scale has adequate reliability with a Cronbach alpha of .77.

***Maslach model of burnout.*** Maslach and Leiter (1997) proposed an alternative approach to engagement by comparing the concept with burnout. The research on burnout is quite extensive and dates back over three decades (Maslach, Schaufeli, & Leiter, 2001). Contemporary research in the subject pursues the argument that engagement is the positive antithesis to burnout. Maslach and Leiter (1997) described burnout as consisting of three key elements that include exhaustion, cynicism, and inefficacy. The researchers argued that engagement is characterized by energy, involvement, and efficacy, the opposite of burnout.

*Maslach Burnout Inventory (MBI).*

The MBI is designed to measure individual levels of burnout (Maslach, Jackson, & Leiter, 1996). The instrument consists of 22 items distributed amongst three scales described as emotional exhaustion, depersonalization, and personal accomplishment. The emotional exhaustion element measures feelings of exhaustion about one's work. Depersonalization is a measure of detachment to one's identity. High scores in emotional exhaustion and depersonalization suggest higher levels of burnout. Personal accomplishment is described as an individual's feelings related to her/his accomplishments and competencies. The instrument demonstrated good reliability with Cronbach alpha ranging from .71 to .90 (Maslach et al., 1996). Test-retest reliability after two to four weeks ranged from .60 to .82 (Maslach et al., 1996). The MBI has also demonstrated good discriminant and convergent validity (Maslach et al., 1996). Some controversy exists in the use of the MBI to assess engagement. Schaufeli and Bakker

(2004) argued that it is unlikely burnout and engagement have a perfect negative correlation, and that studying both constructs using a single instrument creates issues with concurrent validity.

***Rothbard model of engagement.*** The Rothbard (2001) model of engagement, although influenced by the work of Kahn (1990), takes a different perspective on the concept. Rothbard developed her model based on multiple roles of family and work. She defined engagement as “attention devoted to and absorption in work and family” (p. 665). The two elements of role engagement in Rothbard’s model—attention and absorption—are described as the time one spends thinking about a role (work and/or family), and the intensity of the focus, respectively. Rothbard argued although the concepts of attention and absorption are similar they have distinct characteristics. Attention is described by Rothbard as an, “invisible, material resource that a person can allocate in multiple ways” (p. 657). Absorption has more of an intrinsic motivational element that can be related to either positive or negative emotions. An individual, argued Rothbard, can be fully absorbed in an activity they enjoy, leading to positive emotions, or feel negative emotions when absorbed in a challenging frustrating problem. Rothbard’s research has also focused on the enriching or depleting relationship between family and work roles. The enrichment argument suggests a positive relationship between roles, whereas the depletion argument suggests a negative relationship. Rothbard’s research points to an argument that depletion is more prevalent with women in the work to family direction, and an enriching relationship exists from family to work. Men, argued Rothbard, have a positive enriching relationship from work to family.

*Measuring engagement using the Rothbard model.*

Rothbard's (2001) instrument, based on the two elements of attention and absorption, is composed of four questions related to attention and five for absorption. The questions are further divided into work and family engagement. Questions related to attention focus on thinking about and concentration on work and family. The absorption questions center on losing track of time, getting carried away and becoming engrossed in work and family activities. Attention and absorption have moderate correlation (work  $r = .56$ , family  $r = .52$ ) suggesting they are similar, but yet distinct elements (Rothbard, 2001). The instrument has good reliability with Cronbach alphas ranging from .77 to .95 (Rothbard, 2001).

***Schaufeli and Bakker model of work engagement.*** The concept of engagement developed by Schaufeli and Bakker (2004) is arguably the most widely accepted construct in academia. Schaufeli and Bakker defined engagement as, "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 4-5). *Vigor* refers to an individual's level of energy, how willing they are to invest themselves in their work, having resilience and not easily fatigued, and the ability to deal persistently with difficult situations. *Dedication* has similarities to Kahn's (1990) notion of meaningfulness in which an individual feels a sense of significance in their work that they are not only proud of, but also enthusiastic to pursue. A person high in dedication also finds their work challenging and inspiring. *Absorption* is characterized by how immersed an individual is in their work. When an individual is absorbed in their

work time seems to pass by quickly and everything outside of work is absent from an individual's thoughts.

Schaufeli and Bakker (2004) further divided engagement into two concepts of employee engagement and work engagement. The researchers argued that work engagement is a description for the relationship one has with their work, whereas employee engagement is the relationship one has with the organization. The concept of employee engagement also has many similarities to other well established constructs such as employee satisfaction, adding to the argument by Schaufeli and Bakker that work engagement is a unique construct describing a new phenomenon.

*Utrecht Work Engagement Scale (UWES).*

The UWES is arguably the most discussed and studied instrument used in academic research with engagement, which provides for greater discussion than the aforementioned instruments. The instrument is a 17-item survey designed to measure engagement based on vigor, dedication, and absorption (Schaufeli & Bakker, 2004). Six questions relate to vigor, five for dedication, and six for absorption. Questions related to vigor focus on energy, resilience, and endurance. Individuals who score high in vigor typically demonstrate passion and persistence in their work. Dedication is assessed through questions centering on enthusiasm and finding meaning in work. Scoring high in dedication signifies an individual finds their work challenging, rewarding, and of great value. Absorption questions center on being drawn into one's work. A high score in absorption describes an individual who is consumed by their work and feels happy while



in such a state of involvement. Each question is based on a seven–point scale ranging from “never” to “always every day”.

The instrument demonstrates good reliability with a Cronbach alpha of .80 to .90 and a test–retest reliability of .63 to .72 for all questions, .64 to .71 for vigor, and .58 to .69 for dedication and absorption (Schaufeli & Bakker, 2004). The UWES also demonstrates good construct (Seppala et al., 2009) and factorial (Nerstad, Richardsen, & Martinussen, 2010) validity. Confirmatory factor analysis on the UWES demonstrates the three factor structure is better than a single factor (Schaufeli & Bakker, 2004). The correlations between vigor, dedication, and absorption range have been found to be quite high ( $r = .65$ ), which has led some researchers to argue the construct has only one factor (Sonnentag, 2003). The correlations between the latent factors have been reported to range from .80 to .90 (Schaufeli & Bakker, 2004). Considering this data, Schaufeli, Bakker, and Salanova (2006) suggested for practical purposes the total work engagement score is a better measure than the individual vigor, dedication, and absorption scores. The discriminant validity of the UWES has been studied comparing a number of similar constructs such as personal initiative (Salanova & Schaufeli, 2008; Sonnentag, 2003), job involvement, and organizational commitment (Hallberg & Schaufeli, 2006).

***Consulting organization models of engagement and related instruments.***

Several consulting organizations have developed their own concepts and measures of engagement that have arguably fueled much of the research surrounding the subject, making them worthy of discussion. Towers Watson (formerly Towers Perrin) (2003, 2007, 2011) and Gallup have published the most research on engagement in the consulting realm. Both organizations report exceedingly low engagement numbers for

the majority of companies throughout the world, which suggest high levels of engagement range between 20 and 30 percent of employees. The current model of engagement used by Towers Watson has expanded upon earlier work to encompass a more holistic perspective that not only includes elements of engagement, but also well-being (social, physical, and emotional needs), and a supportive work environment. Gallup's model centers on a survey instrument used to measure engagement based on factors related to role responsibility, resources, opportunity to develop, feedback from supervisors, meaningful work, and social support. Gallup's instrument, arguably the most widely used, has been utilized to survey over 10 million individuals in more than 40 languages and over 100 countries around the world (Wagner & Harter, 2006). Towers Watson (2007) have also surveyed tens of thousands of individuals in nearly 20 countries. No quantitative analysis has been published on the instrument used by Towers Watson, and only minimal data is available on the Gallup instrument, which suggests the instrument has acceptable reliability with a Cronbach alpha of .88 to .91 (Avery, McKay, & Wilson, 2007; Harter et al., 2002). Schaufeli and Bakker (2010) have been critical of the Gallup instrument, suggesting the high correlation ( $r = .91$ ) between a single question related to overall satisfaction and the engagement questions demonstrates the survey is simply measuring satisfaction and not the new concept of engagement. The researchers also suggested the identical correlation ( $r = .22$ ) between business unit outcomes and satisfaction and engagement found by Harter et al. (2002) meta-analysis using the Gallup instrument furthers their argument that Gallup's model of engagement is very similar to the well established concept of job satisfaction.

Summarizing the engagement constructs, some key themes begin to emerge. The most significant is being absorbed in one's work, which is arguably linked to another theme of having meaningful work. The research also suggests a significantly untapped potential for organizations to improve. If the majority of individuals are not truly engaged in their work, as the data suggests, further research into both why this is and what may lead to increasing engagement has the promise to not only improve organizational performance, but also improve the value of an individual's life, which the majority of time is spent working. If further research can answer the why and how questions both groups will likely benefit.

**Concepts similar to work engagement.** The contemporary concept of engagement has ties to the historical concepts of job involvement (Lodahl & Kejner, 1965), job satisfaction (Locke, 1976), flow (Csikszentmihalyi, 1990), and organizational commitment (Mowday, Steers, & Porter, 1979). Schaufeli and Bakker (2010) argued that although each of these concepts is similar to work engagement they all have varying degrees of differentiation with the construct they have developed.

Job involvement is described as the degree of psychological identification one has with their work and the importance work has to one's self image (Lodahl & Kejner, 1965), which Schaufeli and Bakker (2010) argued is similar to work engagement, but cannot be considered equal to it. Job satisfaction (Locke, 1976), argued Schaufeli and Bakker, tends to focus on an individual's perception about work, whereas work engagement is more focused on the individual's feelings at work. The researchers argued satisfaction is more of a feeling of content and calmness, while engagement is more centered on creation of excitement and enthusiasm. The concept of flow described by

Csikszentmihalyi (1990) as an optimal feeling one experiences when they are fully absorbed in an activity has similarities to the element of absorption in the Schaufeli and Bakker (2004) construct of engagement. However, flow tends to be viewed as a short-term experience, and engagement more typical of long-term experience. Organizational commitment (Mowday et al., 1979) has also been compared to engagement, but as Schaufeli and Bakker (2010) argued, engagement is not so much related to the relationship one has with the organization, but more so with the work one does within the organization. It is likely too early to draw a clear distinction between engagement and similar theories and constructs, but with further research a clear separation or merging may take place. What perhaps is most unique about the work engagement construct is the clear focus on organizational and individual performance as opposed to simply an individual state of being.

**Engagement and outcomes.** The study of engagement is still relatively new, but a growing body of research suggests there is a relationship between the concept and various outcomes. Studying Spanish and Dutch workers, Llorens, Bakker, Schaufeli, and Salanova (2006) found a positive relationship between engagement and organizational commitment. Hallberg and Schaufeli (2006) studied technology consultants and uncovered a negative relationship between engagement and turnover, suggesting engaged workers are less likely to quit. Koyuncu, Burke, and Fiksenbaum (2006) in their research of female managers and professionals at a Turkish bank, found engagement to predict job satisfaction and decrease the likelihood to quit. Finally, Sonnentag (2003), in research conducted studying employees at public service organizations, uncovered a positive

relationship between engagement and proactive behavior such as pursuing learning opportunities.

Additional research studying engagement and performance outcomes has come from two meta-analyses, one using the Gallup employee engagement model (Harter et al., 2002), and the other utilizing the Schaufeli and Bakker work engagement construct (Halbesleben, 2010). Harter et al. (2002) combined the research using the Gallup instrument that was used to survey nearly 200,000 participants in over 7,000 business units at 36 organizations from a wide variety of industries. Since the research focused on the use of the Gallup data, the researchers use the term employee engagement, which they define as “the individual’s involvement and satisfaction with as well as enthusiasm for work” (p. 269). Satisfaction and engagement data was correlated with key performance measures of safety, turnover, productivity, profitability, and customer satisfaction. Safety data related to incident rates and percentage of lost workdays. Turnover was measured as an annual percentage, and productivity was measured using a variety of metrics that included revenue per person or from an evaluation by management based on available measures of performance. Profitability was measured as a percentage of overall revenue and customer satisfaction–loyalty was an average of various customer satisfaction measurements (Harter et al., 2002). Harter et al. also developed a composite performance measure by combining all performance indicators except safety. A financial composite indicator was also created based on productivity and profitability. The researchers measured satisfaction using a single item on the survey and the remaining 12 were used to assess engagement.

Harter et al. (2002) reported the highest correlations between overall satisfaction and engagement with customer satisfaction (.32 and .33), turnover (-.30 and -.36), and safety (-.20 and -.32). Correlation between both satisfaction and engagement and the composite performance measure was the same for both ( $r = .22$ ). Although the satisfaction and engagement correlations with productivity (.20 and .25) and profitability (.15 and .17) are lower, Harter et al. argued they are still supportive of their hypothesis that all of the measured factors are related to business outcomes, and warrant attention by organizational leaders.

Halbesleben (2010), using the Schaufeli and Bakker (2004) construct of work engagement, conducted a meta-analysis using 53 studies containing the responses from over 45,000 participants. Halbesleben defined engagement using the previously discussed Schaufeli and Bakker (2004) construct that includes the key elements of vigor, dedication, and absorption. The researcher proposed several hypotheses, one of which focused on the relationship between work engagement and positive outcomes such as health, performance, organizational commitment, and turnover. The majority of the studies included in the analysis utilized the UWES instrument to measure work engagement and those that did not use the instrument were coded to fit the UWES structure. The studies also included only those focused on a work environment and excluded research measuring group or team engagement. Both published and unpublished research was used to avoid a bias towards statistically significant results that tend to appear in published work (Rosenthal, 1991). Halbesleben found support for his hypothesis with overall engagement correlated highest with organizational commitment having a true score correlation of .38, followed by performance with a score of .30, and

turnover intention at -.22. Halbesleben's research suggested individuals who are engaged in their work are less likely to quit, are more committed to their organizations, and perform at a high level. While somewhat vague in defining the terms commitment and performance, the research does provide an argument more work needs to be done to explore these relationships and how they may impact organizational outcomes.

Summarizing the performance research in engagement, what is clear is the potential exists to significantly improve performance by tapping into the unused capacity many individuals bring with them to work each day. Whether this untapped potential is engagement or some other aspect of organizational theory is yet to be determined, but what the current body of research suggests is individuals want to utilize their potential, and if organizational leadership provides the chance, they will seek to maximize the opportunity.

**Challenges to the concept of work engagement.** Overall, the concept of engagement has faced significantly less criticism in comparison to the emotional intelligence research. One could argue this may be due to less research and popular press coverage of the topic, or perhaps because intuitively the reasoning behind engagement makes logical sense and is more difficult to challenge. Having a higher degree of engagement in one's work should naturally lead to a more positive interaction with customers, which in effect may lead to improved business results since customer satisfaction drives much of organizational success and failure.

Little and Little (2006) argued the concept of engagement lacks a clear definition and has not been distinguished as an attitude or behavior. The researchers also argued engagement contains too much overlap with other concepts to be considered unique.

With the study of engagement still in a state of maturity, one should expect a variety of definitions, concepts, and constructs to exist, but as Little and Little argued, more work needs to be done to fully expand the concept into a construct that can be analyzed from a scientific perspective. Bakker and Leiter (2010b) appeared to agree with Little and Little, suggesting more work needs to be done to define the broad concept of work engagement into a widely agreed upon construct. There is also clearly overlap between various concepts such as job involvement and organizational commitment, and significant quantitative research is yet to be done comparing job satisfaction and engagement (Schaufeli & Bakker, 2010). The current body of knowledge makes a solid argument for the results engagement may produce, but significant research must continue to expand upon this belief to establish whether or not what is being studied is something new or simply old wine in a new bottle.

**Engagement influences.** Understanding what influences engagement has been the focus of research conducted by several groups in academia and the business world. Schaufeli and Bakker (2004) have found that in some populations age is positively related to engagement, but overall it appears to have little relationship. Their research also showed men to have statistically higher levels of engagement, but the researchers argued the difference is so small it lacks any practical value. Schaufeli and Bakker have also found differences in engagement levels between countries, but their data represents a wide variety of participants whose roles are as diverse as teachers and law enforcement officers, which, the researchers suggested, could make interpretation of the differences difficult. Bakker, Demerouti, and Schaufeli (2003) have also found the level of a wives'



engagement influenced their husbands' engagement levels, suggesting engagement may cross over from one context to another.

With a focus on work outcomes, research suggests several factors influence levels of engagement that include performance feedback, social support, variety in one's work, coaching, autonomy, job resources, recognition, and opportunities to learn (Schaufeli & Bakker, 2010; Towers Perrin, 2003, 2007; Wagner & Harter, 2006). Bakker et al. (2008) described the aforementioned engagement factors as "job resources" (p. 191). The researchers grouped the resources into three categories that include social, physical, and organizational aspects. Bakker et al. argued the resources help reduce psychological and physiological job demands, create an environment conducive to personal growth, learning, and development, and provide support for achieving work goals.

Bakker et al. (2008) suggested job resources have an influence on both intrinsic and extrinsic motivation of an individual. The researchers argued job resources fulfill a basic human need for such elements as competence and autonomy (Deci & Flaste, 1995). Resources also included external motivators such as support and feedback from coworkers and managers that provide stimulus for achieving work goals. Schaufeli and Bakker (2004) conducted research with four samples of Dutch employees that suggested performance feedback, supervisory coaching, and social support are strong predictors of work engagement. In similar research, Koyuncu et al. (2006) studied Turkish female managers and found rewards and recognition, job control and value fit were significant predictors of work engagement.

Clearly, the vast majority of engagement research has focused on external factors as antecedents to engagement, and minimal research has been conducted on internal

factors despite the argument they may also influence individual engagement. Bakker et al. (2008) suggested, “engaged employees seem to differ from other employees in terms of their personal resources, including optimism, self-efficacy, self-esteem, resilience, and active coping style” (p. 193). Kahn’s (1990) seminal work on engagement also suggested psychological differences among individuals may influence their ability to engage in their work. May et al. (2004) have argued emotional experiences are related to engagement, and Towers Perrin (2003, 2007) research suggested emotions and rationality are key elements of engagement that influence an individual’s level of satisfaction, accomplishment, and inspiration to do good work.

Although minimal research has been conducted on potential internal engagement factors, such as emotional intelligence, research has shown emotional intelligence to be related to concepts similar to engagement such as personal satisfaction (Abraham, 2000; Craig, 2005; Martinez-Pons, 2000; Murray, 1998; Schutte et al. 2001), work attitudes, behavior, and outcomes (Carmeli, 2003), self-esteem (Schutte et al., 2002), and job satisfaction (Sy et al., 2006).

Several researchers have provided guidance to future research related to engagement. Saks (2006) suggested future research should consider the differences in individuals that may help predict engagement. The author argued personality variables may be antecedents to engagement. Kular, Gatenby, Rees, Soane, and Truss (2008) supported Sak’s suggestion related to unique variables, such as individual differences, that may predict engagement. Research centered on the relationship between emotional intelligence and work engagement may provide answers to individual differences that influence and predict engagement.

Both emotional intelligence and work engagement need further research to establish conclusions as to whether either concept is of significant value to process improvement experts tasked with applying quality enhancement techniques and methodologies such as TQM and Lean Six Sigma. The growing body of research is beginning to establish the argument both emotional intelligence and work engagement may influence those tasked with leading quality initiatives.

The potential emotional intelligence and work engagement are related also has merit as a worthy area for future research. An argument can be made that individuals who have the ability to understand and control their own emotions, as well as interpret and influence the emotions of others, may also possess the ability to have an optimistic perspective that may lead to a higher probability toward engagement in their work. Alternatively, those individuals low in emotional intelligence may find it difficult to contain their frustration and anger when faced with challenging situations in the work environment, leading to disengagement.

As global competition becomes a necessary element to building a successful strategy for organizational growth, more focus is likely to be placed on process improvement initiatives. The failure or success of implementing the initiatives will likely fall into the hands of process improvement experts. Training in quality techniques such as Lean Six Sigma is likely to yield only partial success. To fully capture the capability of Lean Six Sigma in organizational performance improvement, attention to the emotional intelligence and level of work engagement of process improvement experts is likely to become increasingly important to success.

### Chapter 3

#### Method

Three most commonly used research methods include qualitative, quantitative, and mixed methods (Creswell, 2009). Creswell (2007) suggested qualitative research be used when the researcher wants to create better understanding of an issue, and also for development of theories when they do not exist for the subject matter being studied. Quantitative research is a method for testing theories by studying the relationship between variables that are measured using instruments in order for data to be quantified and analyzed statistically (Creswell, 2009). A mixed method approach utilizes both qualitative and quantitative procedures, and is typically used when the results of one method could be used to select research participants for a second method (Tashakkori & Teddlie, 1998). This method of research may be beneficial to develop theories through qualitative methods and test those theories through quantitative research.

The primary focus of this research sought to understand the relationship between a process improvement expert's emotional intelligence and level of work engagement, making quantitative research the most appropriate method (Creswell, 2009). Both constructs were measured using survey instruments to quantify the results. Data were analyzed in multiple phases beginning with correlation to understand the strength of the relationship between the variables. The second phase of analysis utilized regression analysis to determine the predictability of emotional intelligence to work engagement. A

final phase included the use of analysis of variance (ANOVA) to determine if a mean difference existed between select demographic characteristics.

### **Research Questions**

This research investigated several questions related to a process improvement expert's emotional intelligence and work engagement. The research questions focused on overall emotional intelligence and work engagement, in addition to their related sub-elements. The questions included:

- Questions Q<sub>1-4</sub>: What relationship exists between a process improvement experts' emotional intelligence and (1) work engagement, (2) vigor, (3) dedication, or (4) absorption?
- Questions Q<sub>5-8</sub>: What relationship exists between a process improvement experts' ability to perceive emotions and (5) work engagement, (6) vigor, (7) dedication, or (8) absorption?
- Questions Q<sub>9-12</sub>: What relationship exists between a process improvement experts' ability to use emotion to facilitate thought and (9) work engagement, (10) vigor, (11) dedication, or (12) absorption?
- Questions Q<sub>13-16</sub>: What relationship exists between a process improvement experts' ability to understand emotions and (13) work engagement, (14) vigor, (15) dedication, or (16) absorption?
- Questions Q<sub>17-20</sub>: What relationship exists between a process improvement experts' ability to manage emotions and (17) work engagement, (18) vigor, (19) dedication, or (20) absorption?

- Questions Q<sub>21-24</sub>: Is there a difference in process improvement experts' emotional intelligence based on (21) age, (22) gender, (23) education, or (24) organizational level?
- Questions Q<sub>25-31</sub>: Is there a difference in process improvement experts' work engagement based on (25) age, (26) gender, (27) education, (28) organizational level, (29) years in current position, (30) Six Sigma certification, or (31) ASQ certification?

### **Population and Sampling**

This research utilized random purposeful and criterion sampling. Process improvement experts were solicited to participate in the research through their membership in the American Society for Quality (ASQ). ASQ is the world's largest quality association with over 100,000 members (ASQ, n.d.). The society is described as, "a global community of experts and the leading authority on quality in all fields, organizations, and industries" (ASQ, n.d., para. 1). ASQ is also the administrator of the Malcolm Baldrige National Quality Award, which is considered the highest level of excellence achievement in the U.S. (ASQ, n.d.). Process improvement experts represent individuals within organizations tasked with driving improvement initiatives such as Six Sigma. Motivation and employee involvement, both of which arguably factor into work engagement, are critical elements to the success of a Six Sigma program (McAdam & Evans, 2004).

A link to a description of the research (refer to Appendix A) was emailed to 50,000 randomly selected ASQ members asking for their participation. Before

completing the survey, the participants were asked to accept the informed consent (refer to Appendix B). To entice members to contribute to the research, gift cards and electronics were given away. The invite was emailed to members and one reminder was sent after the initial invite. The survey remained open for a period of three weeks. After reviewing the results of the demographic (control variables) survey answers, participant eligibility was determined. Participants eligible to contribute to the research were defined as meeting at least one of the following criteria:

- More than five years of experience working in process improvement
- Six Sigma certification
- ASQ certification

Newton and Rudestam (1999) provided guidance in determining adequate sample size based on three criteria that included (1) statistical power, (2) alpha level, and (3) effect size. Statistical power is described as a statistical test's ability to determine relationships between variables, and a generally acceptable level by researchers is a power of .80 (Newton & Rudestam, 1999). The alpha level is characterized as the chance of making a Type I error, which is the determination there is a difference between groups or a relationship between variables when there is not (Newton & Rudestam, 1999). Researchers conducting social science research consider an alpha level of .05 as the generally accepted standard (Newton & Rudestam, 1999). Effect size measures the strength of the relationship between variables, and is based on the type of statistical test utilized to analyze the data (Newton & Rudestam, 1999). The size of the effect is classified as small, medium, or large. Newton and Rudestam suggested most researchers seek the ability to detect a medium effect. This research utilized a number of statistical

techniques to analyze the data including correlation, regression, and ANOVA. Cohen (1988) offered guidance in determining medium effect levels and suggested .30 for correlation, .15 for multiple regression, and .25 for ANOVA. Based on this information, this study incorporated a power of .80, alpha of .05, and effect of .30.

The calculated sample size determined by Power and Precision 4 software (<http://www.power-analysis.com>) using a power level of .80, alpha of .05, and an effect size of .30 for correlation analysis equated to a minimum sample of 82. An example calculation offered by Newton and Rudestam (1999) for a correlation study using the same parameters confirmed the software calculation minimum sample size of 82 was correct (p. 77). The calculated sample size for multiple regression using a power level of .80, alpha of .05, and effect size of .15 yielded a needed sample of 80. ANOVA analysis was conducted using a range of two to nine factors. The calculated sample size using a power level of .80, alpha of .05, and effect size of .25 required a sample size ranging from 130 (two factors) to 270 (9 factors). The target minimum sample size for this research was 270 participants.

### **Data Collection and Instrument Reliability and Validity**

Data were collected using an online survey. ASQ members who agreed to participate in the research completed the demographic (refer to Appendix C), Assessing Emotions Scale (refer to Appendix D), and Utrecht Work Engagement Scale (UWES) (refer to Appendix F) surveys. The Assessing Emotions Scale was used to measure emotional intelligence and the UWES was utilized to measure work engagement. The surveys were combined into a single survey to allow for completion of the process in a



single session. All survey instruments were administered online to aid in the ease of data collection and analysis by the researcher and data entry by participants. The surveys were hosted on the Survey Monkey (<http://www.surveymonkey.com>) web site, and all respondent data was secured through a login/password available to only the researcher.

When using existing instruments Creswell (2009) suggested the researcher needs to establish the validity and reliability of each instrument. Creswell described validity of an instrument as “whether one can draw meaningful and useful inferences from scores on the instruments” (p. 149). Several types of validity exist, such as content—does the instrument measure the content they were intended to measure?; predictive—do the scores predict the criteria being measured?; and construct—do the measures determine the hypothetical constructs? (Creswell). The reliability of an instrument can be defined as “the measuring instruments ability to provide consistent results in repeated uses” (Zickmund, 1994, p. 293). One method for determining reliability by measuring internal consistency can be done through the calculation of the Cronbach’s alpha statistic, which describes the correlation of the performance of each item on the instrument with its overall performance of the assessment (Salkind, 2003). Values of Cronbach’s alpha exceeding .70 are generally thought of as a rule of thumb for instrument reliability (Nunnally & Bernstein, 1994). Another method of assessing reliability is through test–retest correlation, which measures the stability of an instrument when administered a second time (Creswell). Both instruments used in this research have demonstrated adequate reliability in numerous studies (see Appendix H and Schaufeli & Bakker, 2004). Cronbach’s alpha were calculated for both scales used in this research.

The Assessing Emotions Scale (refer to Appendix D) is a 33 item survey used to measure emotional intelligence in four branches that include (1) perception of emotions, (2) managing emotions in the self, (3) managing the emotions of others, and (4) using emotions. Each of the four branches were measured by answering self-assessment questions on a scale of one to five. An answer of one indicated strong disagreement, and answering five indicated strong agreement. Ten of the questions focused on appraisal of emotion in one's self and others (questions 5, 9, 15, 18, 19, 22, 25, 29, 32, 33). Nine questions were used to measure expressing emotions (questions 2, 3, 10, 12, 14, 21, 23, 28, 31). Regulating emotions of one's self and others was measured through eight questions (questions 1, 4, 11, 13, 16, 24, 26, 30), and using emotions to solve problems was analyzed through six questions (questions 6, 7, 8, 17, 20, 27). Scoring the instrument was done by summing the scores of all questions except answers to questions five, 28, and 33, which were reverse scored. A higher score indicated higher emotional intelligence.

The instrument has been used in several studies (refer to Appendix H), all of which suggest adequate reliability and validity of the instrument. In the development of the instrument in which 346 participants contributed, Schutte et al. (1998) reported an internal consistency with a Cronbach alpha of .90 for overall emotional intelligence. Internal consistencies for the subscales were somewhat lower ranging from .55 (using emotion to solve problems) to .80 (appraisal of emotion in one's self and others) (Ciarrochi et al., 2001). Test-retest reliability after two weeks was .78 for the overall scale (Schutte et al., 1998). The validity of the instrument has been analyzed through comparison with the Emotional Quotient Inventory (EQ-i) and Mayer-Salovey-Caruso

Emotional Intelligence Test (MSCEIT) in which Brackett and Mayer (2003) reported a correlation of .43 and .18, respectively. Both correlations were statistically significant, however, the MSCEIT had a much weaker correlation with the instrument, suggesting the scale is most similar to the EQ-i. Brackett and Mayer also tested the relationship between the Assessing Emotions Scale and the Big Five Personality measures, and found correlations with openness had the strongest relationship ( $r = .47$ ), albeit relatively weak, having a shared variance of 22%. The instrument is free to use with the permission of the author (refer to Appendix E). Consideration was given to the MSCEIT and EQ-i instruments for use in this research, but, arguably, a challenge in using these surveys is their length. The MSCEIT has 141 questions and the EQ-i has 133, which would likely lower the response rates drastically. The Assessing Emotions Scale presented the most logical option for this research because of its brevity and robustness.

The UWES is a 17 item survey designed to measure work engagement based on three key elements that include vigor, dedication, and absorption (Schaufeli & Bakker, 2004). Vigor measures a respondent's energy level; dedication centers on measuring how inspired and proud one is of their work; and absorption seeks to understand how immersed a person is in their work (Schaufeli & Bakker, 2004). Six questions related to vigor (questions 1, 4, 8, 12, 15, 17), five for dedication (questions 2, 5, 7, 10, 13), and six for absorption (questions 3, 6, 9, 11, 14, 16). Each question was answered based on a seven point scale ranging from never to always every day. A total engagement score was calculated by summing the individual question answers and dividing the score by the total number of questions. Sub-scale scores were calculated by summing the total score

for individual questions and dividing by the number of questions related to the sub-scale. The total and sub-scale engagement scores could range from zero and six.

The instrument demonstrated good reliability with a Cronbach alpha of .80 to .90 (Schaufeli, Bakker, & Salanova, 2006), and a test-retest reliability of .63 to .72 for all questions, .64 to .71 for vigor, and .58 to .69 for dedication and absorption (Schaufeli & Bakker, 2004). The UWES also demonstrated good construct (Seppala et al., 2009) and factorial (Nerstad et al., 2010) validity. The instrument is free to use based on the conditions it be used for non-commercial educational or research purposes, and the researcher agrees to share some of the data collected with the authors (refer to Appendix G) (Schaufeli, 2010).

Data from all surveys were exported from the Survey Monkey website into a MS Excel™ spreadsheet located on the password protected laptop of the researcher. The data were filtered for those participants meeting the aforementioned eligibility requirements. All participants not meeting the eligibility requirements were excluded. The data were also filtered for eligible participants that had answered all emotional intelligence and work engagement questions. The data were used to analyze research questions one through 20. Eligible participants who answered all emotional intelligence, work engagement, and applicable demographic questions were used to analyze research questions 21 through 31. The filtered data were imported from MS Excel™ into Minitab™ for statistical analysis. A sequential number uniquely identified each participant (i.e. 1, 2, 3, etc.). The numbers were assigned in the order in which participants completed the survey. No names of the participants were collected to protect the anonymity of the respondents. This created an added level of privacy for the

participants, and also allowed the researcher the ability to share the raw data file with peer reviewers who could provide advice in completing the statistical analysis.

### **Data Analysis**

The research data were analyzed in multiple phases. The first phase of analysis focused on research questions one through 20, which centered on the relationship between overall emotional intelligence and work engagement, and the sub-elements of each construct. The study of relationships between variables is best analyzed statistically through the use of correlation analysis (Newton & Rudestam, 1999). There are four primary statistical methods used for analyzing correlation that include the Pearson product-moment coefficient, the Spearman rank order coefficient, the point biserial coefficient, and the phi coefficient (Fowler, 1987). Based on the assumptions that data from the Assessing Emotions Scale and UWES instruments are considered interval data, the analysis concerned the correlation between two variables (bivariate), and the variables have a normal distribution, the Pearson product-moment correlation was best suited for the data analysis. Normality of the data was analyzed using Minitab™ to generate a histogram. Normality is considered important because it is the foundation of all parametric statistics (Newton & Rudestam, 1999). Newton and Rudestam (1999) suggested a histogram is the easiest way to assess data normality. The authors also suggested when sample size is greater than 50, which was expected with this research, normality measures can be relaxed. The use of a histogram was also used for error checking purposes to identify potential coding errors.

Correlation analysis was used to determine the strength of the relationship between emotional intelligence and work engagement, but correlation does not necessarily mean causation. Understanding the relationship between the variables is valuable, but from a pragmatic perspective the relationship alone lacked practical use to quality professionals. This research sought to provide direction to practitioners striving to increase work engagement of process improvement experts, which required a full understanding of the level of predictability emotional intelligence had to work engagement.

The next phase of analysis utilized regression to infer the level of predictability emotional intelligence had to work engagement. The overall emotional intelligence and sub-elements of emotional intelligence were classified as independent variables, and overall work engagement and sub-elements of work engagement were classified as dependent variables. Simple and multiple regression was used to analyze the strength of the prediction between the variables. Simple regression deals with studies of only two variables (Sanders, 1995), and multiple regression is utilized to explore the relationship between multiple independent variables and a single dependent variable (Newton & Rudestam, 1999).

This research tested 20 hypotheses that included the overall emotional intelligence score and four sub-elements to emotional intelligence to overall work engagement and three sub-elements of work engagement. The following hypotheses were tested:

- Hypothesis H<sub>01-4</sub>: Process improvement experts with high and low emotional intelligence will have no difference in levels of (1) work engagement, (2) vigor, (3) dedication, and (4) absorption.

- Hypothesis H<sub>a1-4</sub>: Process improvement experts with high emotional intelligence will have higher levels of (1) work engagement, (2) vigor, (3) dedication, and (4) absorption.
- Hypothesis H<sub>05-8</sub>: Process improvement experts with a high and low ability to perceive emotions will have no difference in levels of (5) work engagement, (6) vigor, (7) dedication, and (8) absorption.
- Hypothesis H<sub>a5-8</sub>: Process improvement experts with a high ability to perceive emotions will have higher levels of (5) work engagement, (6) vigor, (7) dedication, and (8) absorption.
- Hypothesis H<sub>09-12</sub>: Process improvement experts with a high and low ability to use emotion to facilitate thought will have no difference in levels of (9) work engagement, (10) vigor, (11) dedication, and (12) absorption.
- Hypothesis H<sub>a9-12</sub>: Process improvement experts with a high ability to use emotion to facilitate thought will have higher levels of (9) work engagement, (10) vigor, (11) dedication, and (12) absorption.
- Hypothesis H<sub>013-16</sub>: Process improvement experts with a high and low ability to understand emotions will have no difference in levels of (13) work engagement, (14) vigor, (15) dedication, and (16) absorption.
- Hypothesis H<sub>a13-16</sub>: Process improvement experts with a high ability to understand emotions will have higher levels of (13) work engagement, (14) vigor, (15) dedication, and (16) absorption.

- Hypothesis H<sub>017-20</sub>: Process improvement experts with a high and low ability to manage emotions will have no difference in levels of (17) work engagement, (18) vigor, (19) dedication, and (20) absorption.
- Hypothesis H<sub>a17-20</sub>: Process improvement experts with a high ability to manage emotions will have higher levels of (17) work engagement, (18) vigor, (19) dedication, and (20) absorption.

Regression analysis provided guidance in determining which variables of emotional intelligence predicted work engagement. However, the analysis did not provide value in understanding if individual characteristics of process improvement experts played into emotional intelligence and/or work engagement. To determine how the demographic characteristics of process improvement experts influenced emotional intelligence and/or work engagement further analysis was required.

The final phase of analysis explored hypothesis focused on demographic characteristics, emotional intelligence, and work engagement. Differences of emotional intelligence and work engagement between participant groups was analyzed using ANOVA, a statistical method used to compare the mean differences between two or more groups (Sanders, 1995). The following hypothesis were tested:

- Hypothesis H<sub>021-24</sub>: There is no significant difference in process improvement expert's emotional intelligence based on (21) age, (22) gender, (23) education, and/or (24) organizational level.
- Hypothesis H<sub>a21-24</sub>: There is a significant difference in process improvement expert's emotional intelligence based on (21) age, (22) gender, (23) education, and/or (24) organizational level.



- Hypothesis  $H_{o25-31}$ : There is no significant difference in process improvement expert's work engagement based on (25) age, (26) gender, (27) education, (28) organizational level, (29) years in current position, (30) Six Sigma certification, and/or (31) ASQ certification.
- Hypothesis  $H_{a25-31}$ : There is a significant difference in process improvement expert's work engagement based on (25) age, (26) gender, (27) education, (28) organizational level, (29) years in current position, (30) Six Sigma certification, and/or (31) ASQ certification.

Additional descriptive statistics were also computed for demographic, emotional intelligence, and work engagement data of participants that included count, minimum, maximum, mean, and standard deviation.

### **Study Assumptions, Risks, and Limitations**

Several assumptions, risks, and limitations to this research existed. Two assumptions included that the research participants would answer questions honestly and truthfully, and the construct of emotional intelligence and work engagement could be measured using the proposed instruments. With completely anonymous responses from participants, and the very unlikely chance that any of the experts would know the researcher, there was little reason to believe the respondents would not answer truthfully.

Potential ethical risks to the research were mitigated through the review of the research by a human subject review board. The researcher presented the review board with a synopsis of the research for their review and approval before data collection began (see Appendix I). Anonymity of the participants also presented a potential risk. The

participant's responses were coded, and all data was stored on a password protected laptop and/or website that was accessible to only the researcher.

There were several limitations to this research related to the instruments, the ability to generalize the results of any findings, and the limitations to the correlation, regression analysis, and ANOVA. While the instruments are considered acceptable for this research they were limited by their validity and reliability. The findings may not be generalized to individuals outside of the quality profession.

Survey fatigue was also a potential limitation to the research. To minimize the chance of fatigue and incomplete responses, the emotional intelligence and work engagement surveys were presented to participants before the demographic questions. This helped increase the probability that even if a participant decided to stop answering questions they would likely complete the questions this research centered on.

An additional limitation to this research was response bias. Fowler (2002) described response bias as the effect non-responses may have on survey data. To check for response bias, wave analysis (Leslie, 1972) using ANOVA was conducted to compare the mean emotional intelligence and work engagement scores of early respondents (first week of survey) to late responders (last week of survey). Wave analysis helps in understanding if the results would have been the same if all participants invited to contribute would have done so. Creswell (2009) suggested late responders represent non-respondents, and if a change exists between early and late responders there is a chance of response bias. A final limitation to the research was the sole use of ASQ members. The results of this research may not be generalizable to process improvement experts who are not members of ASQ.

## Chapter 4

### Results

The primary focus of this research sought to understand the relationship between a process improvement expert's emotional intelligence and level of work engagement. Process improvement experts are routinely tasked with developing and executing total quality management (TQM) and Lean Six Sigma initiatives, both of which place a heavy emphasis on creating a culture of teamwork and continual improvement. Two potential elements that may impact the success of process improvement experts working in such environments are their level of emotional intelligence and work engagement. Research suggests that individuals with high emotional intelligence outperform those with low intelligence (Bar-On, 2006; Goleman, 1995, 1998; Nadler, 2010; O'Boyle et al., 2011), and organizations with high employee engagement are more successful than those with low engagement (Harter, Schmidt, Asplund, Killham, & Agrawal, 2010; Towers Perrin, 2003, 2007; Wagner & Harter, 2006). The results of this research provide insight to understanding how the emotional intelligence of a process improvement expert may create a pathway to increase work engagement.

Both constructs were measured using survey instruments to quantify the results. Data were analyzed in multiple phases beginning with correlation to understand the strength of the relationship between the variables. The second phase of analysis utilized regression analysis to determine the predictability of emotional intelligence to work

engagement. A final phase included the use of analysis of variance (ANOVA) to determine if a mean difference existed between select demographic characteristics. Post hoc analysis was also conducted on ANOVA results found to be statistically significant.

To illustrate the data analysis, this chapter is divided into eight sections that include (1) a brief review of the research questions used to establish hypotheses for testing, (2) a summary of participant selection criteria, data collection, and coding, (3) demographic characteristic statistics, (4) instrument data analysis and reliability statistics, (5) descriptive statistics, (6) wave analysis results, (7) correlation analysis results, and (8) hypothesis testing results.

### **Research Questions**

This research investigated several questions related to a process improvement expert's emotional intelligence and work engagement. The research questions focused on overall emotional intelligence and work engagement, in addition to their related sub-elements. The questions included:

- Questions Q<sub>1-4</sub>: What relationship exists between a process improvement experts' emotional intelligence and (1) work engagement, (2) vigor, (3) dedication, and (4) absorption?
- Questions Q<sub>5-8</sub>: What relationship exists between a process improvement experts' ability to perceive emotions and (5) work engagement, (6) vigor, (7) dedication, and (8) absorption?

- Questions Q<sub>9-12</sub>: What relationship exists between a process improvement experts' ability to use emotion to facilitate thought and (9) work engagement, (10) vigor, (11) dedication, and (12) absorption?
- Questions Q<sub>13-16</sub>: What relationship exists between a process improvement experts' ability to understand emotions and (13) work engagement, (14) vigor, (15) dedication, and (16) absorption?
- Questions Q<sub>17-20</sub>: What relationship exists between a process improvement experts' ability to manage emotions and (17) work engagement, (18) vigor, (19) dedication, and (20) absorption?
- Questions Q<sub>21-24</sub>: Is there a difference in process improvement experts' emotional intelligence based on (21) age, (22) gender, (23) education, or (24) organizational level?
- Questions Q<sub>25-31</sub>: Is there a difference in process improvement experts' work engagement based on (25) age, (26) gender, (27) education, (28) organizational level, (29) years in current position, (30) Six Sigma certification, or (31) ASQ certification?

### **Sample Description and Data Collection and Coding**

Process improvement experts were solicited to participate in the research through their membership in the American Society for Quality (ASQ). A total of 50,000 U.S. and Canadian members were randomly emailed to participate in the research. Participants eligible to contribute to the research were defined as meeting at least one of the following criteria:

- More than five years of experience working in process improvement
- Six Sigma certification
- ASQ certification

Data were collected using an online survey hosted on the Survey Monkey (<http://www.surveymonkey.com>) web site. ASQ members who participated in the research completed the demographic (refer to Appendix C), Assessing Emotions Scale (refer to Appendix D), and Utrecht Work Engagement Scale (UWES) (refer to Appendix F) surveys. The Assessing Emotions Scale was used to measure emotional intelligence and the UWES was utilized to measure work engagement.

Data from all surveys were exported from the Survey Monkey website into a MS Excel™ spreadsheet located on the login/password protected laptop of the researcher. The data were filtered for those participants meeting the aforementioned eligibility requirements. All participants not meeting the eligibility requirements were excluded from the analysis. The filtered data were coded to transform textual responses (i.e. agree, disagree, etc.) to numeric (i.e. 1, 2, 3, etc.). The search and replace function in MS Excel™ was used to transform and code the data. To ensure accurate transformation and coding of the data, a copy of the original data was compared to the coded data and checked for errors. The filtered and coded data were imported from MS Excel™ into Minitab™ for statistical analysis. To ensure accurate importing of the data into Minitab™, a total record count was compared between the MS Excel™ and Minitab™ data.

A total of 5,784 participants responded, which equated to an overall response rate of 11.6%. Ten percent of the responses were excluded because of missing data ( $n = 247$ ,

4%) and/or lack of eligibility qualifications ( $n = 350$ , 6%). The remaining 5,187 (90%) responses were used in the analysis.

### **Demographic Data**

A number of demographic characteristics were collected from participants that included industry, gender, age, organizational level, job function, number of years working in process improvement and in current position, education, level of Six Sigma certification, and current ASQ certification. Table 3 shows the industries in which participants were employed.

The vast majority of participants worked in the manufacturing industry, which represented nearly half of all respondents ( $n = 2,554$ , 49.2%). Within the manufacturing industry, medical devices ( $n = 668$ , 12.9%), chemicals and allied products ( $n = 505$ , 9.7%), and transportation ( $n = 406$ , 7.8%) comprised the majority of the participants. The services industry was the second largest industry participants identified with ( $n = 663$ , 12.8%). Consulting/business services represented the largest group within the services industry ( $n = 420$ , 8.1%). Also worth noting is the large number of participants who specified “other” ( $n = 1,187$ , 22.9%) and did not identify themselves as working within one of the industry choices.

Table 3

*Summary of Participant Industry Statistics (n = 5,187)*

Industry	<i>n</i>	<i>% of total</i>
Education	140	2.7
Business, Secretarial, Vocational	36	0.7
Educational Services	48	0.9
Elementary/Secondary (or K-12)	8	0.2
Higher Education	48	0.9
Government	254	4.9
Healthcare	389	7.5
Hospitals	178	3.4
Medical and Dental Laboratories	72	1.4
Miscellaneous Health and Allied Services	126	2.4
Offices and Clinics of Doctors of Medicine	13	0.3
Manufacturing	2554	49.2
Chemicals and Allied Products	505	9.7
Electronics	294	5.7
Fabricated Metals	354	6.8
Industrial Machinery and Computer Equipment	223	4.3
Measuring and Controlling Instruments	104	2.0
Medical Devices	668	12.9
Transportation (automotive, aerospace, and rail)	406	7.8
Services	663	12.8
Consulting/Business Services	420	8.1
Entertainment/Hospitality/Recreation	18	0.3
Financial/Insurance	104	2.0
Transportation/Logistics Services	47	0.9
Wholesale/Retail	74	1.4
Other	1187	22.9



Table 4 shows the distribution of age and gender amongst participants. More than half the respondents were male ( $n = 3,166$ , 61.0%), although female participants ( $n = 2,021$  39.0%) represented well over a third of all respondents. The results were similar to U.S. and Canadian ASQ member demographics, which are 68.7% male and 31.3% female (S. Sanders, personal communication, February 20, 2012). The largest age group for both males and females were those aged 46 to 55. Over a third of the male participants fell into the 46 to 55 age group ( $n = 1,171$ , 37.0%), and greater than a third of females ( $n = 788$ , 39.0%) were within the age group. Both males ( $n = 39$ , 1.2%) and females ( $n = 23$ , 1.1%) were least represented in the 25 and under age groups.

Table 4

*Summary of Participant Gender and Age Statistics (n = 5,187)*

Gender/Age	<i>n</i>	%
Female	2021	39.0
19 to 25	23	1.1
26 to 35	304	15.0
36 to 45	532	26.3
46 to 55	788	39.0
56 to 65	354	17.5
Over 65	20	1.1
Male	3166	61.0
18 or under	1	0.03
19 to 25	38	1.2
26 to 35	308	9.7
36 to 45	742	23.4
46 to 55	1171	37.0
56 to 65	766	24.2
Over 65	140	4.4

Tables 5 and 6 show participant's organizational level and function, respectively. Three organizational levels were established that included employee, middle management, and senior management. Based upon the participant's response (see Appendix C), they were grouped into one of the three categories. Middle management ( $n = 2,270$ , 43.8%) represented nearly half of all participants. Over three quarters of those categorized as middle management identified themselves as a manager ( $n = 1,774$ , 78.1%). Senior managers were the smallest participant group ( $n = 872$ , 16.8%). Within the senior management group the majority identified themselves as a director ( $n = 628$ , 72.0%). From a functional perspective, shown in Table 6, most participants identified themselves as a manager ( $n = 1,378$ , 26.6%) or an engineer ( $n = 1,059$ , 20.4%). The smallest functional groups were educators/instructors ( $n = 70$ , 1.3%) and students ( $n = 28$ , 0.5%).

Table 5

*Summary of Participant Organizational Level Statistics (n = 5,187)*

Organizational Level	<i>n</i>	%
Employee	1734	33.4
Middle Management	2270	43.8
Supervisor	496	21.9
Manager	1774	78.1
Senior Management	872	16.8
Director	628	72.0
Vice President	114	13.1
President	64	7.3
C-Level Executive	66	7.6
Other	311	6.0

Table 6

*Summary of Participant Function Statistics (n = 5,187)*

Function	<i>n</i>	%
Analyst	219	4.2
Auditor	280	5.4
Consultant	309	6.0
Director	516	9.9
Educator/Instructor	70	1.3
Engineer	1059	20.4
Inspector	95	1.8
Manager	1378	26.6
Master Black Belt	138	2.7
President/Vice President/CEO	121	2.3
Specialist	445	8.6
Student	28	0.5
Supervisor	189	3.6
Technician	164	3.2
Other	176	3.4

The majority of participants had extensive experience working with process improvement as shown in Table 7. Nearly half of the participants had more than 15 years of process improvement experience ( $n = 2,588$ , 49.9%). As expected, based upon eligibility requirements, the smallest group were those with less than a year of process improvement experience ( $n = 100$ , 1.9%). Table 7 also shows that nearly half of the participants were new to their current position having worked in the position from one to five years ( $n = 2,428$ , 46.8%).

Table 7

*Summary of Participant Process Improvement (PI) Experience and Current Position Tenure Statistics ( $n = 5,187$ )*

	Yrs PI Exp		Yrs in Pos	
	<i>n</i>	%	<i>n</i>	%
Less than 1 year	100	1.9	726	14.0
1 to 5 years	444	8.6	2428	46.8
6 to 10 years	1039	20.0	1091	21.0
11 to 15 years	1016	19.6	472	9.1
More than 15 years	2588	49.9	470	9.1

Educational levels of participants is shown in Table 8, which indicates most were well educated. In total, the vast majority of participants had at least a bachelor's degree ( $n = 4,174$ , 80.5%). The largest single group of participants had a bachelor's degree ( $n = 2,187$ , 42.2%), and greater than a third of all respondents also had a master's degree ( $n = 1,789$ , 34.5%).

Table 8

*Summary of Participant Education Statistics (n = 5,187)*

Education	<i>n</i>	%
GED or HS Diploma	324	6.2
Tech Cert or Degree	287	5.5
Associate	402	7.8
Bachelor	2187	42.2
Master	1789	34.5
Doctorate	198	3.8

Tables 9 and 10 show participant's Six Sigma and ASQ certifications, respectively. Nearly half of all participants had no Six Sigma certification ( $n = 2,503$ , 48.3%). The most widely held Six Sigma certification participants had was Green Belt certification ( $n = 1,141$ , 22.0%). Green belt is a mid-level certification in the Six Sigma hierarchy that is preceded by white and yellow belts, and followed by the most advanced belts of black and master black belt. Just over half of all participants had no ASQ certifications ( $n = 2,741$ , 52.8%). The most widely held ASQ certifications participants had were quality auditor (CQA) ( $n = 1,122$ , 21.6%) and quality engineer (CQE) ( $n = 930$ , 17.9%).

Table 9

*Summary of Participant Six Sigma Certification Statistics (n = 5,187)*

Six Sigma Certification	<i>n</i>	%
None	2503	48.3
White Belt	115	2.2
Executive	32	0.6
Champion	57	1.1
Yellow Belt	188	3.6
Green Belt	1141	22.0
Black Belt	917	17.7
Master Black Belt	234	4.5

Table 10

*Summary of Participant ASQ Certification Statistics (n = 5,187)*

ASQ Certification	<i>n</i>	%
Biomedical Auditor - CBA	42	0.8
Calibration Technician - CCT	42	0.8
HACCP Auditor - CHA	56	1.1
Mgr of Quality/Org Excellence - CMQ/OE	677	13.1
Master Black Belt – CMBB	22	0.4
Pharmaceutical GMP Professional - CPGP	17	0.3
Quality Auditor - CQA	1122	21.6
Quality Engineer - CQE	930	17.9
Quality Improvement Associate - CQIA	225	4.3
Quality Inspector - CQI	152	2.9
Quality Process Analyst - CQPA	58	1.1
Quality Technician - CQT	297	5.7
Reliability Engineer - CRE	120	2.3
Six Sigma Black Belt - CSSBB	427	8.2
Six Sigma Green Belt - CSSGB	229	4.4
Software Quality Engineer - CSQE	114	2.2
None	2741	52.8

Summarizing the demographic characteristics of the participants, most worked in the manufacturing industry and were males aged 46 to 55. The majority worked in middle management with functional responsibilities as a manager or engineer. Most participants had at least a bachelor's degree, but did not have Six Sigma or ASQ certifications.



### **Data Analysis and Instrument Reliability**

Existing instruments were used in this research. The Assessing Emotions Scale was used to measure emotional intelligence, which is defined as “the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10). The UWES was utilized to measure work engagement, which is defined as:

...a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behavior. (Schaufeli & Bakker, 2004, p. 4-5)

The Assessing Emotions Scale (refer to Appendix D) is a 33 item survey. The instrument measures emotional intelligence based on four branches of emotional intelligence that include (1) perception of emotions—the ability to identify emotions, (2) managing emotions in the self—the ability to control emotions, (3) managing the emotions of others—the ability to understand emotions, and (4) using emotions—the ability to use emotions to process thoughts and make decisions. Each of the four branches was measured by answering self-assessment questions on a scale of one to five. An answer of one indicated strong disagreement, and answering five indicated strong agreement. Ten of the questions focused on appraisal of emotion in one’s self and others (questions 5, 9, 15, 18, 19, 22, 25, 29, 32, 33). Nine questions were used to measure expressing

emotions (questions 2, 3, 10, 12, 14, 21, 23, 28, 31). Regulating emotions of one's self and others was measured through eight questions (questions 1, 4, 11, 13, 16, 24, 26, 30), and using emotions to solve problems was analyzed through six questions (questions 6, 7, 8, 17, 20, 27). Scoring the instrument was done by summing the scores of all questions except answers to questions five, 28, and 33, which were reverse scored. A higher score indicated higher emotional intelligence.

The UWES is a 17 item survey designed to measure work engagement based on three key elements that include vigor, dedication, and absorption (Schaufeli & Bakker, 2004). Vigor measures a respondent's energy level; dedication centers on measuring how inspired and proud one is of their work; and absorption seeks to understand how immersed a person is in their work (Schaufeli & Bakker, 2004). Six questions were related to vigor (questions 1, 4, 8, 12, 15, 17), five for dedication (questions 2, 5, 7, 10, 13), and six for absorption (questions 3, 6, 9, 11, 14, 16). Each question was answered based on a seven point scale ranging from never to always every day. A total engagement score was calculated by summing the individual question answers and dividing the score by the total number of questions. Sub-scale scores were calculated by summing the total score for individual questions and dividing by the number of questions related to the sub-scale. A higher score indicated higher work engagement.

Both instruments used in this research have previously demonstrated adequate reliability in numerous studies (see Appendix H and Schaufeli & Bakker, 2004). Despite previous research suggesting the instruments are reliable, Cronbach's alpha were calculated for both scales to validate previous results. Table 11 shows the Cronbach alphas reported by the instrument author(s) and those calculated for this study. The

Cronbach alpha reported by Schutte et al. (1998) were nearly identical to those calculated for this study. Sub-scale alphas were slightly higher for this study in comparison to those reported by previous research (Ciarrochi et al., 2001). The overall Cronbach alpha for the UWES was slightly higher than reported by the authors (Schaufeli & Bakker, 2004). The sub-scale alphas for the UWES as reported by the authors (Schaufeli & Bakker, 2004) were similar to those calculated for this study. The results of the Cronbach alphas calculated for this study indicate both instruments have adequate reliability.

Table 11

*Summary of Cronbach Alpha Statistics (n = 5,187)*

	Reported Cronbach alpha by instrument author	Cronbach alpha for this study
EI	.90	.89
POE	.76	.83
MSE	.63	.76
MOE	.66	.67
UOE	.55	.70
WE	.93	.94
VI	.82	.85
DE	.89	.91
AB	.83	.80

Note. EI = Emotional Intelligence, POE = Perception of Emotions, MSE = Managing Emotions in Self, MOE = Managing Emotions of Others', UOE = Utilization of Emotions, WE = Work Engagement, VI = Vigor, DE = Dedication, AB = Absorption.

### Descriptive Statistics

Descriptive statistics for participant's emotional intelligence, work engagement and their respective sub-scales is shown in Table 12. Emotional intelligence scores ranged from 52 to 165 with a mean of 130.32 and a standard deviation of 13.54. Work engagement scores ranged from 0.1 to 6 with a mean of 4.40 and a standard deviation of .89.

Normality of the data was analyzed using Minitab™ to generate histograms for overall emotional intelligence and work engagement scores as illustrated in Figures 5 and 6, respectively. Morgan, Leech, Gloeckner, and Barrett (2004) provide guidelines for determining data normality suggesting a skewness value ranging between -1.00 and +1.00 demonstrates the data follow a normal distribution. The skewness of emotional intelligence scores was -0.56, and work engagement scores had a skewness of -0.79, which indicates both datasets are normally distributed. The histograms were also used for error checking purposes to identify potential coding and importing errors. All emotional intelligence scores were between 33 and 165, and work engagement scores were between zero and six, which validated no coding errors existed. The total number of responses in MS Excel™ ( $n = 5,187$ ) also matched the number imported into Minitab™, validating no data were lost during the import process.

Table 12

*Summary of Means, Standard Deviations, Minimums, and Maximums for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) and Related Sub-elements of Each Scale (n = 5,187)*

	M	SD	Min	Max
EI	130.32	13.54	52.00	165.00
POE	38.37	5.61	13.00	50.00
MSE	37.08	4.38	14.00	45.00
MOE	31.22	3.84	9.00	40.00
UOE	23.65	3.21	7.00	30.00
WE	4.40	.89	0.10	6.00
VI	4.49	.90	0.00	6.00
DE	4.52	1.08	0.00	6.00
AB	4.21	.92	0.20	6.00

Note. EI = Emotional Intelligence, POE = Perception of Emotions, MSE = Managing Emotions in Self, MOE = Managing Emotions of Others', UOE = Utilization of Emotions, WE = Work Engagement, VI = Vigor, DE = Dedication, AB = Absorption.

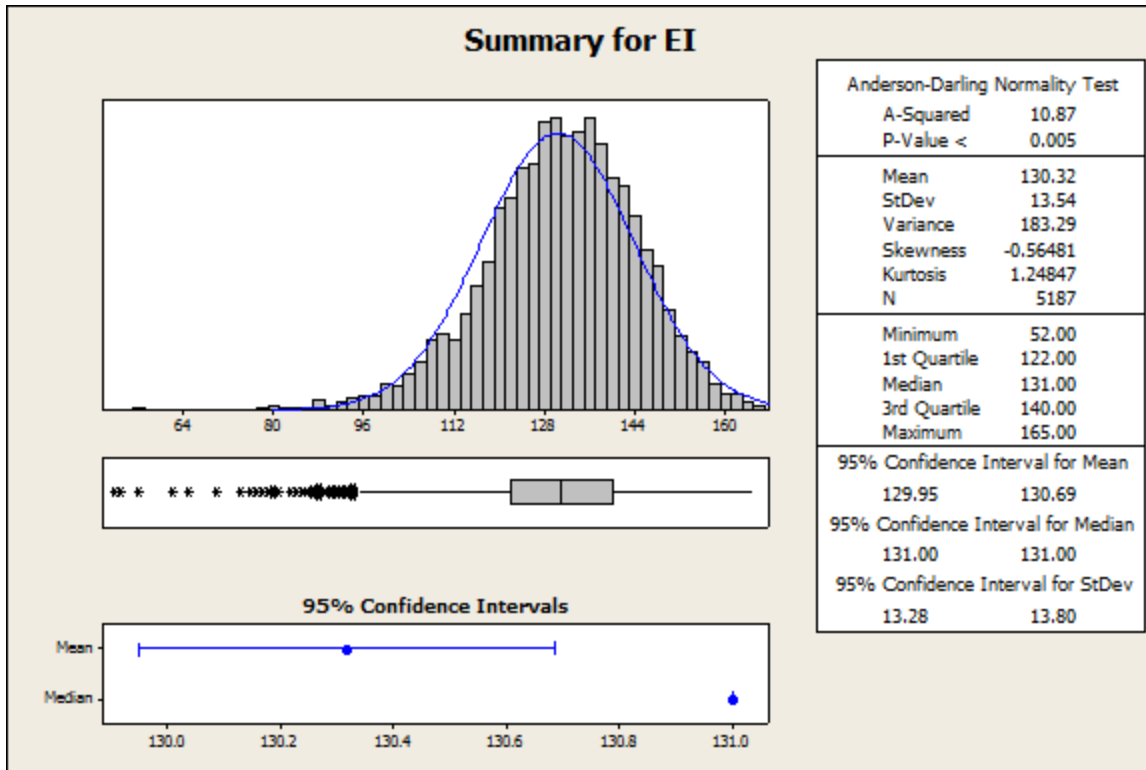


Figure 5. Histogram of Emotional Intelligence scores with normal curve overlaid.

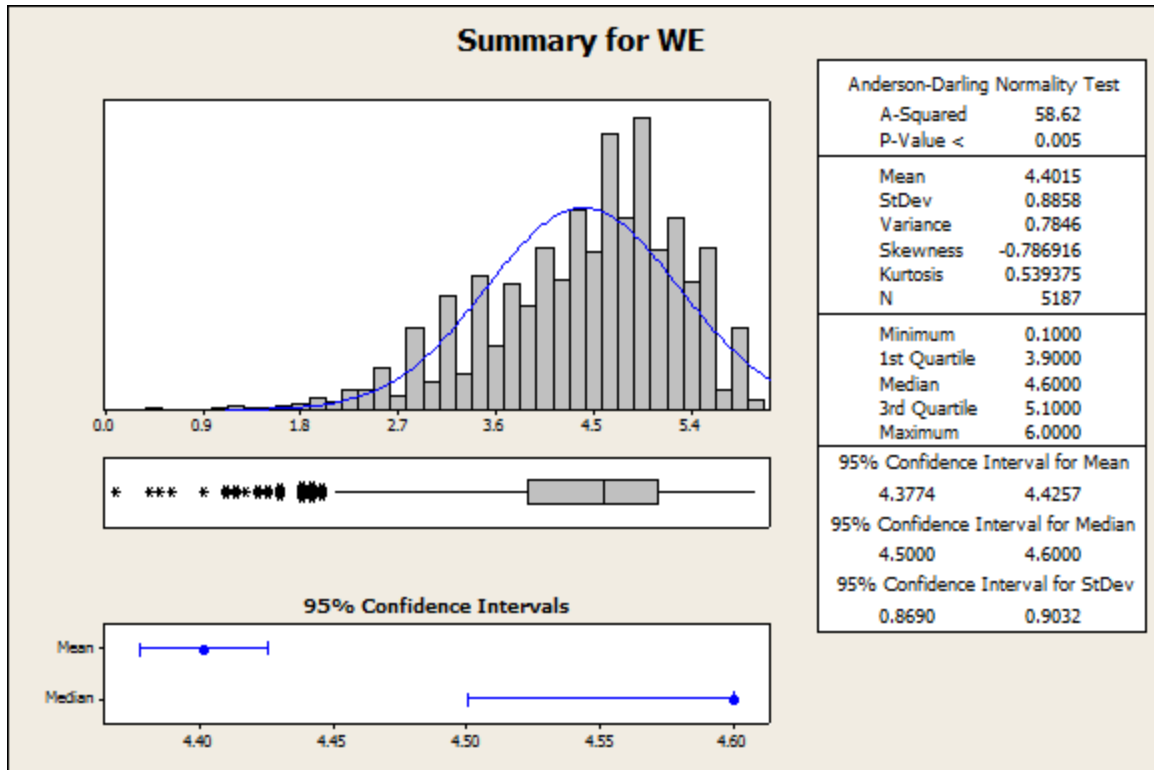


Figure 6. Histogram of Work Engagement scores with normal curve overlaid.



### Wave Analysis

Fowler (2002) described response bias as the effect non-responses may have on survey data. To check for response bias, wave analysis (Leslie, 1972) using ANOVA was conducted to compare the mean emotional intelligence and work engagement scores of early respondents (first 1,000 participants) to late responders (last 1,000 participants). Wave analysis helps in understanding if the results would have been the same if all participants invited to contribute would have done so. Creswell (2009) suggested late responders represent non-respondents, and if a change exists between early and late responders there is a chance of response bias.

The mean and standard deviations for emotional intelligence and work engagement scores from the first 1,000 respondents (week one) and the last 1,000 respondents (week three) are shown in Table 13. The one-way ANOVA between week one and three indicated the emotional intelligence scores were nearly identical. There was no significant effect on emotional intelligence,  $F(1, 1988) = 0.00, p = .960$ . This indicates there is little chance of response bias in the emotional intelligence scores between weeks. There was a significant effect on work engagement,  $F(1, 1988) = 4.84, p = .028$ . The results indicated there was a difference in work engagement scores between week one and week three participants. Week three participants had significantly higher work engagement scores than week one participants indicating there is a chance of response bias.

Table 13

*Summary of Means and Standard Deviations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) by Week Survey was Completed*

	<i>n</i>	M	SD
Week 1	1000		
EI		130.03	13.25
WE		4.36	.91
Week 3	1000		
EI		130.00	13.81
WE		4.45	.87

### Correlation Analysis Results

The research data were analyzed in multiple phases. The first phase of analysis focused on research questions one through 20, which centered on the relationship between overall emotional intelligence and work engagement, and the sub-elements of each construct. Correlation analysis was used to determine the strength of the relationship between emotional intelligence and work engagement. The Pearson product-moment correlation was utilized to measure the overall strength of the relationship.

The correlation analysis results are shown in Table 14. The relationship between emotional intelligence and work engagement, including the sub-elements of each construct, were found to be related and statistically significant at the  $p < 0.001$  level. The correlation results for the relationship between emotional intelligence and work engagement indicate a moderate relationship exists,  $r(5185) = .416, p < .001$ . The strongest relationships were found between the emotional intelligence sub-element,

managing emotions in the self, and the work engagement sub–element of vigor,  $r(5185) = .523, p < .001$ . Managing emotions in the self also had a moderate relationship with work engagement,  $r(5185) = .475, p < .001$ . Although statistically significant at the  $p < 0.001$  level, the relationships between the emotional intelligence sub–element perception of emotion and the work engagement sub–element vigor,  $r(5185) = .179, p < .001$ , and the sub–elements utilization of emotions and dedication,  $r(5185) = .183, p < .001$ , were found to be the weakest. In summary, the correlation results suggest both emotional intelligence and work engagement, in addition to each construct’s sub–elements, are moderately related and statistically significant at the  $p < .001$  level.

Table 14

*Summary of Inter-correlations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) and Related Sub-elements of Each Scale (n = 5,187)*

Measure	1	2	3	4	5	6	7	8	9
1. EI	-								
2. POE	.826***	-							
3. MSE	.816***	.507***	-						
4. MOE	.828***	.582***	.596***	-					
5. UOE	.670***	.349***	.480***	.468***	-				
6. WE	.416***	.271***	.475***	.353***	.211***	-			
7. VI	.457***	.322***	.523***	.372***	.208***	.936***	-		
8. DE	.396***	.252***	.462***	.348***	.183***	.932***	.846***	-	
9. AB	.301***	.179***	.333***	.258***	.194***	.898***	.746***	.735***	-

Note. EI = Emotional Intelligence, POE = Perception of Emotions, MSE = Managing Emotions in Self, MOE = Managing Emotions of Others’, UOE = Utilization of Emotions, WE = Work Engagement, VI = Vigor, DE = Dedication, AB = Absorption. \*\*\* $p < 0.001$ .

### Research Hypotheses Results

**Simple regression analysis.** The second phase of analysis utilized regression to infer the level of predictability emotional intelligence had to work engagement. The overall emotional intelligence and sub-elements of emotional intelligence were classified as independent variables, and overall work engagement and sub-elements of work engagement were classified as dependent variables. Simple regression was used to determine the one-to-one predictability of overall emotional intelligence and each of the construct's related sub-elements to work engagement and each of the construct's related sub-elements. The results for the simple regression analysis are shown in Table 15. A total of 20 hypotheses were tested using simple regression.

Table 15

*Summary of Emotional Intelligence and Related Sub-element Predictors of Work Engagement and Related Sub-elements Using Simple Regression (n = 5187)*

Predictor	WE		VI		DE		AB	
	$R^2$	$\beta$	$R^2$	$\beta$	$R^2$	$\beta$	$R^2$	$\beta$
EI	.173	.027***	.209	.030***	.157	.032***	.091	.020***
POE	.073	.043***	.103	.052***	.063	.048***	.032	.029***
UOE	.044	.058***	.043	.058***	.033	.061***	.037	.056***
MOE	.124	.081***	.138	.087***	.121	.098***	.067	.062***
MSE	.226	.096***	.273	.108***	.213	.114***	.110	.070***

Note. EI = Emotional Intelligence, POE = Perception of Emotions, MSE = Managing Emotions in Self, MOE = Managing Emotions of Others', UOE = Utilization of Emotions, WE = Work Engagement, VI = Vigor, DE = Dedication, AB = Absorption. \*\*\*p < 0.001.

***Hypotheses one through four.*** Hypotheses one through four focused on the predictability overall emotional intelligence had to work engagement and the related sub-elements of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{01-4}$ : Process improvement experts with high and low emotional intelligence will have no difference in levels of (1) work engagement, (2) vigor, (3) dedication, and (4) absorption.
- Hypothesis  $H_{a1-4}$ : Process improvement experts with high emotional intelligence will have higher levels of (1) work engagement, (2) vigor, (3) dedication, and (4) absorption.

The regression results for hypotheses one through four were found to be statistically significant at the  $p < .001$  level, therefore the null hypotheses were rejected and the alternative hypotheses accepted. The independent variable, emotional intelligence, explained a significant amount of variance in the dependent variable, work engagement,  $R^2 = 17.3\%$ ,  $F(1, 5185) = 1086.85$ ,  $p < .001$ . The results of the regression analysis determined 17.3% of the variability in work engagement can be explained by emotional intelligence. Emotional intelligence explained the most variability in vigor,  $R^2 = 20.9\%$ ,  $F(1, 5185) = 1370.53$ ,  $p < .001$ , accounting for 20.9% of the variability, and the least in absorption,  $R^2 = 9.1\%$ ,  $F(1, 5185) = 398.05$ ,  $p < .001$ , accounting for only 9.1% of the variability.

***Hypotheses five through eight.*** Hypotheses five through eight focused on the predictability the ability to perceive emotions had to work engagement and the related sub-elements of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis H<sub>05-8</sub>: Process improvement experts with a high and low ability to perceive emotions will have no difference in levels of (5) work engagement, (6) vigor, (7) dedication, and (8) absorption.
- Hypothesis H<sub>a5-8</sub>: Process improvement experts with a high ability to perceive emotions will have higher levels of (5) work engagement, (6) vigor, (7) dedication, and (8) absorption.

The regression results for hypotheses five through eight were found to be statistically significant at the  $p < .001$  level, therefore the null hypotheses were rejected and the alternative hypotheses accepted. The independent variable, the ability to perceive emotions, explained a small, but statistically significant amount of variance in the dependent variable, work engagement,  $R^2 = 7.3\%$ ,  $F(1, 5185) = 412.15$ ,  $p < .001$ . The results of the regression analysis determined 7.3% of the variability in work engagement can be explained by the ability to perceive emotions. The ability to perceive emotions explained the most variability in vigor,  $R^2 = 10.3\%$ ,  $F(1, 5185) = 598.81$ ,  $p < .001$ , accounting for 10.3% of the variability, and the least in absorption,  $R^2 = 3.2\%$ ,  $F(1, 5185) = 172.46$ ,  $p < .001$ , accounting for only 3.2% of the variability.

***Hypotheses nine through 12.*** Hypotheses nine through 12 focused on the predictability the ability to use emotion to facilitate thought had to work engagement and the related sub-elements of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis H<sub>09-12</sub>: Process improvement experts with a high and low ability to use emotion to facilitate thought will have no difference in levels of (9) work engagement, (10) vigor, (11) dedication, and (12) absorption.
- Hypothesis H<sub>a9-12</sub>: Process improvement experts with a high ability to use emotion to facilitate thought will have higher levels of (9) work engagement, (10) vigor, (11) dedication, and (12) absorption.

The regression results for hypotheses nine through 12 were found to be statistically significant at the  $p < .001$  level, therefore the null hypotheses were rejected and the alternative hypotheses accepted. The independent variable, the ability to use emotion to facilitate thought, explained a small, but statistically significant amount of variance in the dependent variable, work engagement,  $R^2 = 4.4\%$ ,  $F(1, 5185) = 240.99$ ,  $p < .001$ . The results of the regression analysis determined 4.4% of the variability in work engagement can be explained by the ability to use emotion to facilitate thought. The ability to use emotion to facilitate thought explained the most, albeit a small amount, of variability in vigor,  $R^2 = 4.3\%$ ,  $F(1, 5185) = 234.15$ ,  $p < .001$ , accounting for 4.3% of the variability, and the least in dedication,  $R^2 = 3.3\%$ ,  $F(1, 5185) = 179.38$ ,  $p < .001$ , accounting for only 3.3% of the variability.

**Hypotheses 13 through 16.** Hypotheses 13 through 16 focused on the predictability the ability to understand emotions had to work engagement and the related sub-elements of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis H<sub>013-16</sub>: Process improvement experts with a high and low ability to understand emotions will have no difference in levels of (13) work engagement, (14) vigor, (15) dedication, and (16) absorption.

- Hypothesis  $H_{a13-16}$ : Process improvement experts with a high ability to understand emotions will have higher levels of (13) work engagement, (14) vigor, (15) dedication, and (16) absorption.

The regression results for hypotheses 13 through 16 were found to be statistically significant at the  $p < .001$  level, therefore the null hypotheses were rejected and the alternative hypotheses accepted. The independent variable, the ability to understand emotions, explained a significant amount of variance in the dependent variable, work engagement,  $R^2 = 12.4\%$ ,  $F(1, 5185) = 737.15$ ,  $p < .001$ . The results of the regression analysis determined 12.4% of the variability in work engagement can be explained by the ability to understand emotions. The ability to understand emotions explained the most variability in vigor,  $R^2 = 13.8\%$ ,  $F(1, 5185) = 832.83$ ,  $p < .001$ , accounting for 13.8% of the variability, and the least in absorption,  $R^2 = 6.7\%$ ,  $F(1, 5185) = 370.81$ ,  $p < .001$ , accounting for only 6.7% of the variability.

**Hypotheses 17 through 20.** Hypotheses 17 through 20 focused on the predictability the ability to manage emotions had to work engagement and the related sub-elements of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{017-20}$ : Process improvement experts with a high and low ability to manage emotions will have no difference in levels of (17) work engagement, (18) vigor, (19) dedication, and (20) absorption.
- Hypothesis  $H_{a17-20}$ : Process improvement experts with a high ability to manage emotions will have higher levels of (17) work engagement, (18) vigor, (19) dedication, and (20) absorption.



The regression results for hypotheses 17 through 20 were found to be statistically significant at the  $p < .001$  level, therefore the null hypotheses were rejected and the alternative hypotheses accepted. The independent variable, the ability to manage emotions, explained a significant amount of variance in the dependent variable, work engagement,  $R^2 = 22.6\%$ ,  $F(1, 5185) = 1514.32$ ,  $p < .001$ . The results of the regression analysis determined 22.6% of the variability in work engagement can be explained by the ability to manage emotions. The ability to manage emotions explained the most variability in vigor,  $R^2 = 27.3\%$ ,  $F(1, 5185) = 1949.64$ ,  $p < .001$ , accounting for 27.3% of the variability, and the least in absorption,  $R^2 = 11.0\%$ ,  $F(1, 5185) = 644.95$ ,  $p < .001$ , accounting for only 11.0% of the variability.

Summarizing the simple regression analysis results, null hypotheses one through 20 were rejected and all alternative hypotheses were accepted (see Appendix J for detailed hypotheses summary). The independent variables that included overall emotional intelligence and the related sub-elements of perceiving, using, understanding, and managing emotions explained from 3.2% to 27.3% of the variability in overall work engagement and the related sub-elements of vigor, dedication, and absorption. The strongest predictor to work engagement was the emotional intelligence sub-element managing emotions. The weakest predictor to work engagement was the ability to perceive emotions. All results were statistically significant at the  $p < .001$  level.

**Multiple regression analysis.** Multiple regression was used to determine what each emotional intelligence sub-element, when combined, contributed to predicting overall work engagement and each sub-element of work engagement. A stepwise regression procedure was used to complete the analysis. In step one, managing emotions

in self was entered into the regression equation followed by managing others' emotions, then utilizing emotions, and finally, perception of emotions. The results for the multiple regression analysis are shown in Table 16. Similar to the simple regression results, managing emotions in self was found to be the strongest predictor of overall work engagement, accounting for 22.6% of variability. Managing emotions in the self was also found to be the strongest predictor in each of the work engagement sub-elements, ranging from 11.1% to 27.3% of variability. Unlike the simple regression results, perception of emotions did not explain any variation in work engagement or the sub-elements of dedication or absorption. Utilizing emotions was also not a predictor of the sub-element absorption.

Table 16

*Summary of Emotional Intelligence Sub-element Predictors of Work Engagement and Related Sub-elements Using Multiple Regression (n = 5187)*

Predictor	WE		VI		DE		AB	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
Step 1	.226***		.273***		.214***		.111***	
MSE		.086***		.099***		.104***		.056***
Step 2	.008***		.006***		.008***		.006***	
MOE		.028***		.022***		.041***		.023***
Step 3	.002***		.005***		.005***			
UOE		-.014***		-.024***		-.028***		.007
Step 4			.002***					
POE				.008***		-.004		-.004
Total $R^2$	.236***		.286***		.227***		.116***	

Note. EI = Emotional Intelligence, POE = Perception of Emotions, MSE = Managing Emotions in Self, MOE = Managing Emotions of Others', UOE = Utilization of Emotions, WE = Work Engagement, VI = Vigor, DE = Dedication, AB = Absorption. \*\*\*p < 0.001.

Summarizing the multiple regression results, managing emotions in the self was the strongest predictor of overall work engagement, explaining 22.6% of variation, and the most predictive to the sub–element of vigor, explaining 27.3% of variation. Perception of emotions was the weakest predictor, followed by utilization of emotions, and managing emotions of others'. All statistically significant results were at the  $p < .001$  level.

**ANOVA results.** The final phase of analysis explored hypotheses focused on demographic characteristics versus emotional intelligence, and work engagement. Differences of emotional intelligence and work engagement between participant groups were analyzed using ANOVA, a statistical method used to compare the mean differences between two or more groups (Sanders, 1995). Post hoc analysis was conducted on results shown to be statistically significant when more than two groups were compared. Post hoc analysis is a statistical method used to better understand why a significant difference was found between groups (Newton & Rudestam, 1999). The Tukey honest significant difference test (HSD) was used to conduct the post hoc analysis. The Tukey HSD is a test that compares the range between group means by analyzing the difference between the smallest and largest groups. Newton and Rudestam (1999) argue, Tukey's HSD test is a popular choice for investigating pairwise combinations with a large number of groups, and is a robust method for comparing groups with unequal sample sizes. A total of 11 hypothesis were tested.

**Hypothesis 21.** Hypothesis 21 focused on participant age and emotional intelligence. A one–way ANOVA between participant age was conducted to compare the effect of emotional intelligence. The null and alternative hypotheses were as follows:

- Hypothesis H<sub>o21</sub>: There is no significant difference in process improvement expert's emotional intelligence based on age.
- Hypothesis H<sub>a21</sub>: There is a significant difference in process improvement expert's emotional intelligence based on age.

Participants were placed into one of three age groups representing career level. Early career represented participants from 19 to 35, middle career were those aged from 36 to 55, and late career participants were 56 and older. The emotional intelligence mean and standard deviation for each group are shown in Table 17. There was no significant effect on emotional intelligence,  $F(2, 5184) = 2.14, p = .118$ . The results indicate that age does not have an effect on emotional intelligence, therefore the null hypothesis was not rejected.

Table 17

*Summary of Means and Standard Deviations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) by Participant Age*

Career Level (age)	n	EI		WE	
		M	SD	M	SD
Early (19-35)	673	130.01	12.94	4.46	0.89
Middle (36-55)	3234	130.61	13.61	4.40	0.88
Late (over 55)	1280	129.73	13.64	4.37	0.89

**Hypothesis 22.** Hypothesis 22 focused on participant gender and emotional intelligence. A one-way ANOVA between participant gender was conducted to compare the effect of emotional intelligence. The null and alternative hypotheses were as follows:

- Hypothesis H<sub>o22</sub>: There is no significant difference in process improvement expert's emotional intelligence based on gender.
- Hypothesis H<sub>a22</sub>: There is a significant difference in process improvement expert's emotional intelligence based on gender.

The emotional intelligence mean and standard deviation for each gender are shown in Table 18. There was a significant effect on emotional intelligence,  $F(1, 5185) = 149.02, p < .001$ . Female participants ( $M = 133.13, SD = 12.94$ ) had higher emotional intelligence than males ( $M = 128.51, SD = 13.61$ ). The results indicate that gender does have an effect on emotional intelligence, therefore the null hypothesis was rejected and the alternative hypothesis accepted.

Table 18

*Summary of Means and Standard Deviations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) by Participant Gender*

Gender	n	EI		WE	
		M	SD	M	SD
Female	2021	133.15	12.94	4.43	0.88
Male	3166	128.51	13.61	4.39	0.89

**Hypothesis 23.** Hypothesis 23 focused on participant education and emotional intelligence. A one-way ANOVA between participant education was conducted to compare the effect of emotional intelligence. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{o23}$ : There is no significant difference in process improvement expert's emotional intelligence based on education.
- Hypothesis  $H_{a23}$ : There is a significant difference in process improvement expert's emotional intelligence based on education.

Participants were placed into one of three educational groups. Group one represented participants with a GED, high school diploma, or a technical certification or degree. Group two represented participants with either an associate or bachelor degree. Group three represented participants with either a master or doctoral degree. The emotional intelligence mean and standard deviation for each education level are shown in Table 19. There was a significant effect on emotional intelligence for one of the conditions,  $F(2, 5184) = 5.63, p = .004$ . Post hoc comparisons using the Tukey HSD test indicated the mean score for group three ( $M = 131.11, SD = 14.10$ ) was significantly different than group one ( $M = 129.61, SD = 12.91$ ) and group two ( $M = 129.88, SD = 13.21$ ). The Tukey HSD test did not indicate a difference existed between groups one and two. These results indicate that education does have an effect on emotional intelligence. Participants with graduate degrees had higher emotional intelligence than those with less education. Based on these results, the null hypothesis was rejected and the alternative hypothesis accepted.

Table 19

*Summary of Means and Standard Deviations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) by Participant Level of Education*

Education Group	<i>n</i>	EI		WE	
		M	SD	M	SD
Group 1	611	129.61	12.91	4.42	0.84
Group 2	2589	129.88	13.21	4.33	0.90
Group 3	1987	131.11	14.10	4.48	0.88

*Note.* Group 1 includes GED, HS diploma, and technical certification or degree. Group 2 includes associate and bachelor degrees. Group 3 includes master and doctoral degrees.

**Hypothesis 24.** Hypothesis 24 focused on participant organizational level and emotional intelligence. A one-way ANOVA between participant organizational level was conducted to compare the effect of emotional intelligence. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{024}$ : There is no significant difference in process improvement expert's emotional intelligence based on organizational level.
- Hypothesis  $H_{a24}$ : There is a significant difference in process improvement expert's emotional intelligence based on organizational level.

The emotional intelligence mean and standard deviation for each organizational level are shown in Table 20. There was a significant effect on emotional intelligence for all three of the conditions,  $F(2, 4873) = 26.39, p < .001$ . Post hoc comparisons using the Tukey HSD test indicated the mean score for the employee group ( $M = 128.99, SD = 13.49$ ) was significantly different than the middle management ( $M = 130.34, SD = 13.76$ ) and senior management groups ( $M = 133.05, SD = 12.63$ ). The Tukey HSD test also

indicated the middle management group was also different than the senior management group. The results indicate that organizational level does have an effect on emotional intelligence. Senior managers had the highest scores, followed by middle managers, while participants working as an employee had the lowest scores. Based on the results, the null hypothesis was rejected and the alternative hypothesis accepted.

Table 20

*Summary of Means and Standard Deviations for Scores on the Assessing Emotions Scale (EI) and Utrecht Work Engagement Scale (WE) by Participant Organizational Level*

Org Level	n	EI		WE	
		M	SD	M	SD
Employee	1734	128.99	13.49	4.17	0.96
Mid Mgmt	2270	130.34	13.76	4.45	0.84
Sr Mgmt	872	133.05	12.63	4.71	0.73

**Hypothesis 25.** Hypothesis 25 focused on participant age and work engagement.

A one-way ANOVA between participant age was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{025}$ : There is no significant difference in process improvement expert's work engagement based on age.
- Hypothesis  $H_{a25}$ : There is a significant difference in process improvement expert's work engagement based on age.

Participants were placed into one of three age groups representing career level.

Early career represented participants from 19 to 35, middle career were those aged from 36 to 55, and late career participants were 56 and older. The work engagement mean and



standard deviation for each group are shown in Table 17. There was no significant effect on work engagement,  $F(2, 5184) = 2.39, p = .092$ . The results indicate that age does not have an effect on work engagement, therefore the null hypothesis was not rejected.

**Hypothesis 26.** Hypothesis 26 focused on participant gender and work engagement. A one-way ANOVA between participant gender was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{o26}$ : There is no significant difference in process improvement expert's work engagement based on gender.
- Hypothesis  $H_{a26}$ : There is a significant difference in process improvement expert's work engagement based on gender.

The work engagement mean and standard deviation for each gender are shown in Table 18. There was no significant effect on work engagement,  $F(1, 5185) = 2.37, p = .124$ . Female participants ( $M = 4.43, SD = 0.88$ ) had slightly higher work engagement than males ( $M = 4.39, SD = 0.89$ ). The results indicate that gender does not have an effect on work engagement, therefore the null hypothesis was not rejected.

**Hypothesis 27.** Hypothesis 27 focused on participant education and work engagement. A one-way ANOVA between participant education was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{o27}$ : There is no significant difference in process improvement expert's work engagement based on education.
- Hypothesis  $H_{a27}$ : There is a significant difference in process improvement expert's work engagement based on education.

Participants were placed into one of three educational groups. Group one represented participants with a GED, high school diploma, or a technical certification or degree. Group two represented participants with either an associate or bachelor degree. Group three represented participants with either a master or doctoral degree. The work engagement mean and standard deviation for each education level are shown in Table 19. There was a significant effect on work engagement for one of the conditions,  $F(2, 5184) = 17.71, p < .001$ . Post hoc comparisons using the Tukey HSD test indicated the mean score for group three ( $M = 4.49, SD = 0.88$ ) was significantly different than group two ( $M = 4.33, SD = 0.90$ ), but not different than group one ( $M = 4.42, SD = 0.84$ ). These results indicate that education does have an effect on work engagement. Based on these results, the null hypothesis was rejected and the alternative hypothesis accepted.

**Hypothesis 28.** Hypothesis 28 focused on participant organizational level and work engagement. A one-way ANOVA between participant organizational level was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{028}$ : There is no significant difference in process improvement expert's work engagement based on organizational level.
- Hypothesis  $H_{a28}$ : There is a significant difference in process improvement expert's work engagement based on organizational level.

The work engagement mean and standard deviation for each organizational level are shown in Table 20. There was a significant effect on work engagement for all three of the conditions,  $F(2, 4873) = 122.10, p < .001$ . Post hoc comparisons using the Tukey HSD test indicated the mean score for the employee group ( $M = 4.17, SD = 0.96$ ) was

significantly different than the middle management ( $M = 4.45$ ,  $SD = 0.84$ ) and senior management groups ( $M = 4.71$ ,  $SD = 0.73$ ). The Tukey HSD test also indicated the middle management group was also different than the senior management group. The results indicate that organizational level does have an effect on work engagement. Senior managers had the highest scores, followed by middle managers, while participants working as an employee had the lowest scores. Based on the results the null hypothesis was rejected and the alternative hypothesis accepted.

**Hypothesis 29.** Hypothesis 29 focused on participant years in current position and work engagement. A one-way ANOVA between the number of years in the current position was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{029}$ : There is no significant difference in process improvement expert's work engagement based on years in the current position.
- Hypothesis  $H_{a29}$ : There is a significant difference in process improvement expert's work engagement based on years in current position.

The work engagement mean and standard deviation for each group are shown in Table 21. There was a significant effect on work engagement for three of the conditions,  $F(4, 5182) = 5.34$ ,  $p < .001$ , that included the more than 15, six to 10, and one to five year groups. Post hoc comparisons using the Tukey HSD test indicated the mean score for the more than 15 years group ( $M = 4.55$ ,  $SD = 0.83$ ) was significantly different than the one to five ( $M = 4.36$ ,  $SD = 0.90$ ) and six to 10 years ( $M = 4.38$ ,  $SD = 0.88$ ) groups. However, the more than 15, six to 10, and one to five year groups were not significantly

different than the less than 1 ( $M = 4.46$ ,  $SD = 0.85$ ) and 11 to 15 years ( $M = 4.41$ ,  $SD = 0.93$ ) groups. The results indicate that years in the current position does have an effect on work engagement, therefore the null hypothesis was rejected and the alternative hypothesis accepted.

Table 21

*Summary of Means and Standard Deviations for Scores on the Utrecht Work Engagement Scale (WE) by Participant Years in Current Position*

Years Current Position	<i>n</i>	WE	
		M	SD
Less than 1 year	726	4.46	0.85
1 to 5 years	2428	4.36	0.90
6 to 10 years	1091	4.38	0.88
11 to 15 years	472	4.41	0.93
More than 15 years	470	4.55	0.83

**Hypothesis 30.** Hypothesis 30 focused on participant Six Sigma certification and work engagement. A one-way ANOVA between participant Six Sigma certification was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{030}$ : There is no significant difference in process improvement expert's work engagement based on Six Sigma certification.
- Hypothesis  $H_{a30}$ : There is a significant difference in process improvement expert's work engagement based on Six Sigma certification.

The work engagement mean and standard deviation for each group are shown in Table 22. There was no significant effect on work engagement,  $F(1, 5185) = 1.22, p = .270$ . Certified participants ( $M = 4.41, SD = 0.88$ ) had slightly higher work engagement than non-certified participants ( $M = 4.39, SD = 0.89$ ). The results indicate that having a Six Sigma certification does not have an effect on work engagement, therefore the null hypothesis was not rejected.

Table 22

*Summary of Means and Standard Deviations for Scores on the Utrecht Work Engagement Scale (WE) by Participant Six Sigma Certification*

Six Sigma Cert	n	WE	
		M	SD
No	2503	4.39	0.89
Yes	2684	4.41	0.88

**Hypothesis 31.** Hypothesis 30 focused on participant ASQ certification and work engagement. A one-way ANOVA between participant ASQ certification was conducted to compare the effect of work engagement. The null and alternative hypotheses were as follows:

- Hypothesis  $H_{031}$ : There is no significant difference in process improvement expert's work engagement based on ASQ certification.
- Hypothesis  $H_{a31}$ : There is a significant difference in process improvement expert's work engagement based on ASQ certification.

The work engagement mean and standard deviation for each group are shown in Table 23. There was a significant effect on work engagement,  $F(1, 5185) = 12.96, p <$

.001. Non-certified participants ( $M = 4.45$ ,  $SD = 0.89$ ) had higher work engagement than certified participants ( $M = 4.36$ ,  $SD = 0.88$ ). The results indicate that not having an ASQ certification does have an effect on work engagement, therefore the null hypothesis was rejected and the alternative hypothesis accepted.

Table 23

*Summary of Means and Standard Deviations for Scores on the Utrecht Work Engagement Scale (WE) by Participant ASQ Certification*

ASQ Cert	<i>n</i>	WE	
		M	SD
No	2386	4.45	0.89
Yes	2801	4.36	0.88

Summarizing the results for the ANOVA hypothesis testing, seven of the 11 null hypotheses were rejected and the alternative hypotheses accepted. The results indicated gender, education, and organizational level had an effect on emotional intelligence, while age had no effect. Education, organizational level, years in current position, and having no ASQ certification had an effect on work engagement. No effect on work engagement was found related to age, gender, or having a Six Sigma certification.

## Conclusion

The primary focus of this research sought to understand the relationship a process improvement expert's emotional intelligence had to work engagement. A total of 5,187 U.S. and Canadian ASQ members contributed to the research. The results indicated a moderate relationship exists between the two constructs. The emotional intelligence sub-

element of managing emotions in the self was found to have the strongest relationship with work engagement. Simple regression analysis results indicated emotional intelligence predicted a significant amount of variation in work engagement. The emotional intelligence sub–element of managing emotions in the self was found to explain the most variation in work engagement. Multiple regression results confirmed the simple regression results, indicating the emotional intelligence sub–element of managing emotions in the self was responsible for the majority of the variation in work engagement. All results were statistically significant at the  $p < .001$  level.

A secondary focus of the research sought to understand whether demographic characteristics of participants had an effect on emotional intelligence and work engagement. Several characteristics were found to have an effect on emotional intelligence including gender, education, and organizational level. Work engagement was found to be effected by education, organizational level, years in current position, and not having an ASQ certification. The results were statistically significant at the  $p < .05$  and  $p < .001$  levels.

## Chapter 5

### Discussion

U.S. organizations face a monumental challenge as a global economy has emerged in recent years. Arguably, the global economy is driving competitive forces to levels unimaginable only a few decades ago. In response to global economic pressures, many organizations are embracing process improvement initiatives such as total quality management (TQM) and Lean Six Sigma (George, 2002). Both TQM and Lean Six Sigma strive to increase customer satisfaction and profitability by improving product and service quality through the elimination of non-value added activities and variance reduction (George, 2002). Process improvement experts, the individuals tasked with developing and implementing the TQM and Lean Six Sigma initiatives, arguably, play a critical role in the process. Research also suggests that leadership and teamwork are key elements to success in TQM and Lean Six Sigma initiatives (Connor, 1997; Corrigan, 1995; Hoover, 1995; Jacobsen, 2008; Pheng & Hui, 2004; Sandholm & Sorqvist, 2002).

Several authors have suggested TQM and Lean Six Sigma fail because both employees and leadership are not engaged in the process (Corrigan, 1995; Hoover, 1995; Jacobsen, 2008), which can make the challenge of dealing with global competitive forces ever-more daunting. In general, organizations with engaged employees outperform those with less engaged employees (Wagner & Harter, 2006). Organizations with highly engaged employees have less absenteeism, turnover, theft, and accidents, in addition to



higher customer satisfaction scores, profitability, and productivity (Wagner & Harter, 2006). However, less than 30 percent of employees consider themselves to be highly engaged, costing organizations billions of dollars each year (Gallup Consulting, 2008; Towers Perrin, 2003, 2007). Contemporary employee engagement research indicates disengaged employees make up nearly 35% of organizational payrolls that results in an annual cost of \$340 billion dollars (Rivera & Flinck, 2011). Based on these staggering costs to organizations, understanding what drives engagement is arguably an area of research worthy of investigation, yet, despite the numbers, little research exists related to the antecedents of engagement.

The majority of engagement research has focused on external factors as antecedents to work engagement, and minimal research has been conducted on internal factors, such as emotional intelligence, despite the argument they may also influence individual work engagement. Research has shown emotional intelligence to be related to concepts similar to engagement such as personal satisfaction (Abraham, 2000; Craig, 2005; Martinez–Pons, 2000; Murray, 1998; Schutte et al. 2001), work attitudes, behavior, and outcomes (Carmeli, 2003), self–esteem (Schutte, Malouff, Simunek, Hollander, & McKenley, 2002), and job satisfaction (Sy et al., 2006). This research sought to understand the relationship between emotional intelligence and work engagement of process improvement experts. The primary goal of the research centered on developing a greater understanding as to whether organizational leaders tasked with leading TQM and Lean Six Sigma strategies might be able to tap into individual emotional intelligence, thereby providing a potential pathway to improving work engagement, ultimately leading to more effective TQM and Lean Six Sigma execution.

This chapter presents a summary of the research, findings related to the literature, and conclusions drawn from the data presented in chapter four. Also discussed are the implications of the findings in addition to limitations, delimitations, and risks of the study. The chapter concludes with recommendations for future research.

### **Summary of Study**

This study utilized a quantitative approach to understanding the relationship between emotional intelligence and work engagement of process improvement experts. Process improvement experts were invited to participate in the research through their membership in the American Society for Quality (ASQ). Participants were deemed experts and qualified to contribute if they met the criteria of having at least five years of process improvement experience and/or an ASQ or Six Sigma certification.

An online survey using existing instruments was used to collect data. The Assessing Emotions Scale was used to measure emotional intelligence, and the Utrecht Work Engagement Scale (UWES) was used to measure work engagement. Demographic questions were also used to collect participant data for characteristics that included industry, gender, age, education, organizational level, years working in process improvement, years in current position, and ASQ and Six Sigma certification.

Fifty thousand U.S. and Canadian members were emailed an invitation to contribute, of which 5,187 met the qualification criteria and fully completed the survey. Pearson product–moment correlation analysis was used to determine the strength of the relationship between emotional intelligence and work engagement followed by simple and multiple regression analysis to infer the predictability emotional intelligence had to

work engagement. Analysis of variance (ANOVA) was used to compare mean differences between participants based on demographic characteristics. To establish the research hypotheses (see Appendix J for detailed hypotheses summary) 31 research questions were developed. The following is a discussion of the analysis and findings for each question.

**Questions Q<sub>1-4</sub>.** What relationship exists between a process improvement experts' emotional intelligence and (1) work engagement, (2) vigor, (3) dedication, and (4) absorption? This study discovered a positive relationship between emotional intelligence and work engagement,  $r(5185) = .416, p < .001$ . A positive relationship was also found between emotional intelligence and each of the sub-elements of work engagement. The strongest relationship was found between emotional intelligence and vigor,  $r(5185) = .523, p < .001$ . Regression analysis indicated emotional intelligence predicted 17.3% of the variability in work engagement ( $R^2 = 17.3\%$ ,  $F(1, 5185) = 1086.85, p < .001$ ), and 20.9% of variability in vigor ( $R^2 = 20.9\%$ ,  $F(1, 5185) = 1370.53, p < .001$ ).

**Questions Q<sub>5-8</sub>.** What relationship exists between a process improvement experts' ability to perceive emotions and (5) work engagement, (6) vigor, (7) dedication, and (8) absorption? This study discovered a positive relationship between the ability to perceive emotions and work engagement,  $r(5185) = .271, p < .001$ . A positive relationship was also found between the ability to perceive emotions and each of the sub-elements of work engagement. The strongest relationship was found between the ability to perceive emotions and vigor,  $r(5185) = .322, p < .001$ . Regression analysis indicated the ability to perceive emotions predicted 7.3% of the variability in work engagement ( $R^2 = 7.3\%$ ,

$F(1, 5185) = 412.15, p < .001$ ), and 10.3% of variability in vigor ( $R^2 = 10.3 \%$ ,  $F(1, 5185) = 598.81, p < .001$ ).

**Questions Q<sub>9-12</sub>.** What relationship exists between a process improvement experts' ability to use emotion to facilitate thought and (9) work engagement, (10) vigor, (11) dedication, and (12) absorption? This study discovered a positive relationship between the ability to use emotion to facilitate thought and work engagement,  $r(5185) = .211, p < .001$ . A positive relationship was also found between the ability to use emotion to facilitate thought and each of the sub-elements of work engagement, however, the strongest relationship was with overall work engagement. Regression analysis indicated the ability to use emotion to facilitate thought predicted 4.4% of the variability in work engagement ( $R^2 = 4.4 \%$ ,  $F(1, 5185) = 240.99, p < .001$ ).

**Questions Q<sub>13-16</sub>.** What relationship exists between a process improvement experts' ability to understand emotions and (13) work engagement, (14) vigor, (15) dedication, and (16) absorption? This study discovered a positive relationship between the ability to understand emotions and work engagement,  $r(5185) = .353, p < .001$ . A positive relationship was also found between the ability to understand emotions and each of the sub-elements of work engagement. The strongest relationship was found between the ability to understand emotions and vigor,  $r(5185) = .372, p < .001$ . Regression analysis indicated the ability to understand emotions predicted 12.4% of the variability in work engagement ( $R^2 = 12.4 \%$ ,  $F(1, 5185) = 737.15, p < .001$ ), and 13.8% of variability in vigor ( $R^2 = 13.8 \%$ ,  $F(1, 5185) = 832.83, p < .001$ ).

**Questions Q<sub>17-20</sub>.** What relationship exists between a process improvement experts' ability to manage emotions and (17) work engagement, (18) vigor, (19)

dedication, and (20) absorption? This study discovered a positive relationship between the ability to manage emotions and work engagement,  $r(5185) = .475, p < .001$ , which was also the strongest relationship between the emotional intelligence variables and overall work engagement. A positive relationship was also found between the ability to manage emotions and each of the sub-elements of work engagement. The strongest relationship was found between the ability to manage emotions and vigor,  $r(5185) = .523, p < .001$ , which was also the strongest relationship in the study. Regression analysis indicated the ability to manage emotions predicted 22.6% of the variability in work engagement ( $R^2 = 22.6\%$ ,  $F(1, 5185) = 1514.32, p < .001$ ), and 27.3% of variability in vigor ( $R^2 = 27.3\%$ ,  $F(1, 5185) = 1949.64, p < .001$ ).

**Multiple regression analysis.** Multiple regression was used to determine what each emotional intelligence sub-element, when combined, contributed to predicting overall work engagement and each sub-element of work engagement. A stepwise procedure was utilized by loading the emotional intelligence sub-element variables in descending order based on the strength of correlation with work engagement and the related sub-elements. The multiple regression results were similar to the simple regression results. Managing emotions in self was found to be the strongest predictor of overall work engagement, accounting for 22.6% of variability. Managing emotions in the self was also found to be the strongest predictor in each of the work engagement sub-elements, ranging from 11.1% to 27.3% of variability. Unlike the simple regression results, perception of emotions did not explain any variation in work engagement or the sub-elements of dedication or absorption. Utilizing emotions was also not a predictor of the sub-element absorption.

**Questions Q<sub>21-24</sub>.** Is there a difference in process improvement experts' emotional intelligence based on (21) age, (22) gender, (23) education, or (24) organizational level? This research discovered age ( $F(2, 5184) = 2.14, p = .118$ ) had no effect on emotional intelligence, however, gender ( $F(1, 5185) = 149.02, p < .001$ ), education ( $F(2, 5184) = 5.63, p = .004$ ), and organizational level ( $F(2, 4873) = 26.39, p < .001$ ) were found to effect emotional intelligence.

Female participants ( $M = 133.13, SD = 12.94$ ) had higher emotional intelligence than males ( $M = 128.51, SD = 13.61$ ). Participants with graduate degrees ( $M = 131.11, SD = 14.10$ ) had the highest emotional intelligence followed by those with associate and bachelor degrees ( $M = 129.88, SD = 13.21$ ). Participants with less than an associate degree ( $M = 129.61, SD = 12.91$ ) had the lowest emotional intelligence. Participants working at a senior management level had the highest emotional intelligence ( $M = 133.05, SD = 12.63$ ) followed by middle managers ( $M = 130.34, SD = 13.76$ ). Participants working as employees had the lowest emotional intelligence ( $M = 128.99, SD = 13.49$ ).

**Questions Q<sub>25-31</sub>.** Is there a difference in process improvement experts' work engagement based on (25) age, (26) gender, (27) education, (28) organizational level, (29) years in current position, (30) Six Sigma certification, or (31) ASQ certification? This research discovered age ( $F(2, 5184) = 2.39, p = .092$ ), gender ( $F(1, 5185) = 2.37, p = .124$ ), and having Six Sigma certification ( $F(1, 5185) = 1.22, p = .270$ ) had no effect on work engagement, however, education ( $F(2, 5184) = 17.71, p < .001$ ), organizational level ( $F(2, 4873) = 122.10, p < .001$ ), years in current position ( $F(4, 5182) = 5.34, p <$

.001), and not having an ASQ certification ( $F(1, 5185) = 12.96, p < .001$ ) did have an effect on work engagement.

Participants with graduate degrees had the highest work engagement ( $M = 4.49, SD = 0.88$ ) followed by those with less than an associate degree ( $M = 4.42, SD = 0.84$ ). Participants with an associate or bachelor degree had the lowest work engagement ( $M = 4.33, SD = 0.90$ ). The senior management group had the highest work engagement ( $M = 4.71, SD = 0.73$ ) followed by middle managers ( $M = 4.45, SD = 0.84$ ). Participants working as employees had the lowest work engagement ( $M = 4.17, SD = 0.96$ ). Participants who had been working in their current position more than 15 years ( $M = 4.55, SD = 0.83$ ) had the highest work engagement, while those working in their current position from one to five years ( $M = 4.36, SD = 0.90$ ) had the lowest work engagement. Participants with no ASQ certification ( $M = 4.45, SD = 0.89$ ) had higher work engagement than those with an ASQ certification ( $M = 4.36, SD = 0.88$ ).

### Findings Related to the Literature

***Relationship of emotional intelligence, work engagement, and other similar constructs.*** A number of the findings this study uncovered are supported by previous research. During the literature review phase of the research no studies focused directly on emotional intelligence and work engagement were uncovered. However, during the data collection period of this research Ravichandran, Arasu, and Kumar (2011) published a study using the Assessing Emotions Scale and the shortened version of the UWES. The researchers studied the relationship of emotional intelligence to work engagement using 119 information technology professionals from India. A moderate positive correlation

was found between the variables,  $r(117) = .377, p < .01$ . The results of this study had a similar conclusion as the research conducted by Ravichandran, Arasu, and Kumar, providing further argument that emotional intelligence is positively related to work engagement.

This study also supports previous research examining the relationship between emotional intelligence and various constructs similar to work engagement such as job satisfaction, job involvement, and organizational commitment. Locke (1976) defined job satisfaction as “a pleasurable or positive emotional state resulting from the appraisal of one’s job” (p. 1300). Job involvement is defined as “the degree to which a person is identified psychologically with his work, or the importance of work in his total self-image (Lodahl & Kejner, 1965, p. 24). Mowday et al. (1979) defined organizational commitment as “the relative strength of an individual’s identification with and involvement in a particular organization” (p. 226). Although job satisfaction, job involvement, and organizational commitment are, arguably, distinguishable from work engagement, each of the constructs have been shown to have similarities to work engagement. Hallberg and Schaufeli (2006) studied the relationship between work engagement and job involvement and organizational commitment. The researchers determined a weak to moderate relationship existed between the constructs. Schaufeli, Taris, and Van Rhenen (2008) concluded some overlap existed between job satisfaction and work engagement. Schaufeli and Bakker (2010) have argued work engagement has discriminant validity over the aforementioned constructs, but an argument can be made some similarities do exist.



Mustafa and Amjad (2011) studied university professors in Pakistan and uncovered a positive relationship between emotional intelligence and job satisfaction, job involvement, and organizational commitment using the Emotional Competence Inventory instrument developed by Boyatzis and Goleman (Wolff, 2005). The researchers determined a moderate relationship existed between emotional intelligence and job satisfaction,  $r(148) = .395, p < .01$ , job involvement,  $r(101) = .375, p < .01$ , and organizational commitment,  $r(101) = .350, p < .01$ . Carmeli (2003) conducted similar research studying the relationship between senior manager's emotional intelligence, as measured by the Assessing Emotions Scale, and a number of constructs that included job satisfaction and job involvement. The researcher surveyed 98 senior managers employed in Israel as chief financial officers working in local government positions. Carmeli discovered a positive relationship between emotional intelligence and job satisfaction,  $r(96) = .270, p \leq .01$ , however, the relationship between emotional intelligence and job involvement was found to be positive, but not statistically significant,  $r(96) = .140, p > .05$ . Carmeli also studied the relationship between emotional intelligence and various sub-elements of organizational commitment, one of which was affective organizational commitment. Meyer and Allen (1984) defined affective commitment as "positive feelings of identification with, attachment to, and involvement in the work organization" (p. 375). Carmeli found a positive relationship between emotional intelligence and affective commitment,  $r(96) = .240, p \leq .05$ .

Summarizing the findings of previous literature focused on the relationship emotional intelligence has with work engagement and other similar constructs, an argument can be made that the results of this study are supported by the previous

research, which indicates a positive relationship exists between the constructs. In general, based on this research, and what has previously been conducted, there is support for the argument that emotional intelligence positively effects an individual's attitude and involvement with their work.

***Emotional intelligence and demographics.*** The findings of this research related to demographic characteristics and emotional intelligence both support and contradict previous research. This research found female participants to have higher emotional intelligence than males that was statistically significant, which supports previous research using the Assessing Emotions Scale (Carmeli & Josman, 2006; Ciarrochi et al., 2001; Pau & Croucher, 2003; Saklofske, Austin, Galloway, & Davidson, 2007; Schutte et al., 1998; Van Rooy, Alonso, & Viswesvaran, 2005). Previous research has also found the differences not to be statistically significant (Saklofske, Austin, & Minski, 2003; Schutte, et al., 2001; Wing, Schutte, & Byrne, 2006).

Research conducted by Bar-On (1997) using his instrument, the Emotional Quotient inventory (EQ-i), found no statistically significant difference between males and females when comparing total EQ-i scores, but significant differences were found in females, indicating they had stronger interpersonal skills (i.e. empathy, social responsibility, interpersonal relationships). Bar-On also found that males had higher interpersonal capacity (i.e. self-regard, self-awareness, assertiveness, independence, self-actualization), and were better at managing emotions, and are more adaptable (i.e. flexible, problem solving, reality testing). Brackett and Mayer (2003), measuring emotional intelligence with the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), found females to score significantly higher than males. Earlier research using

the MSCEIT also found a statistically significant difference between male and female participants with females scoring higher (Brackett, 2001; Mayer, Caruso, & Salovey, 1999).

Previous research comparing age and emotional intelligence has offered no definitive conclusion as to whether age has an effect on emotional intelligence. Zeidner et al. (2009) argued little evidence exists to support the theory that emotional intelligence increases with age, despite researchers who have argued age is one of the defining characteristics of the emotional intelligence construct (Mayer et al., 1999). Some research indicated age had an effect on emotional intelligence (Burns, Bastian, & Nettelbeck, 2007), while other research indicated no difference existed (Blickle, Momm, Liu, Witzki, & Steinmayr, 2011). The previous research studying adults and the differences in emotional intelligence both supported and contradicted this research, which found no differences between the three age groups representing early (19–35), middle (36–55), and late (over 55) career process improvement experts.

There does appear to be some agreement that emotional intelligence, as a component of emotional development, increases as a child develops into an adult (Izard, Trentacosta, King, Morgan, & Diaz, 2007). Research by Burns et al. (2007) using multiple instruments, including the Assessing Emotions Scale, supported the argument. The researchers compared young (under 21) and older (over 40) individuals and found a statistically significant difference between the groups,  $t(411) = 2.89, p = .004$ .

Bar-On's (2006) research using the EQ-i found a few significant differences in age groups that he described as "relatively small in magnitude" (p. 6). The highest scores Bar-On reported were from those individuals who were in their forties. This research

also found the middle group (36–55) to have the highest scores, however, the difference between the early and late groups were insignificant. Additional independent research using the EQ-i and MSCEIT provided a conflicting perspective on age and emotional intelligence. Some researchers found statistically significant differences between various age groups (Cavins, 2006; Duncan, 2007; De Vito, 2009; Di Fabio & Letizia, 2008; Wong, 1999), while others found no difference (Jones, 2007; Smith, 2001).

Minimal comparative research was discovered on emotional intelligence and the differences in education and organizational levels. The research that does exist confirmed the results of this study, which found participants with higher levels of education also had higher emotional intelligence. In relation to organizational level and emotional intelligence, this research found senior managers had the highest emotional intelligence, and participants working as employees had the lowest emotional intelligence. Both education and organizational level results were statistically significant at the  $p < .01$  and  $p < .001$  level, respectively.

Research conducted by Rahim and Malik (2010) using the Assessing Emotions Scale to study middle managers working in the Pakistani banking industry concluded education may have an effect on emotional intelligence. The researchers surveyed 196 participants and found those with only an undergraduate degree ( $M = 121.23$ ,  $SD = 13.77$ ) scored lower than individuals with a graduate degree ( $M = 126.16$ ,  $SD = 16.88$ ). The researchers did not conduct a statistical analysis to determine if the results were significant. Alloway (2005) used the MSCEIT to compare the emotional intelligence of 99 senior and middle managers and found senior managers had higher emotional intelligence.

Summarizing the results of this study in comparison to previous research, both confirming and conflicting conclusions can be drawn (see Table 24). This research supports the literature that has previously found significant differences between genders and the research concluding age has no significant effect on emotional intelligence. The research also supports the existing literature suggesting education and organizational level have an effect on emotional intelligence. Previous research concluding age has an effect on emotional intelligence, and gender does not does, however, conflict with the findings of this study.

Table 24

*Summary of comparisons with previous emotional intelligence research*

	This Research		Previous Research	
	Effect	No Effect	Effect	No Effect
Gender	X		X	X
Age		X	X	X
Education	X		X	
Org Level	X		X	

***Work engagement and demographics.*** Academic research studying work engagement is sparse (Schaufeli & Bakker, 2010). The research that does exist both supports and conflicts with the conclusions of this research. Schaufeli and Bakker (2004), in comparing men and women, found men to have statistically higher engagement scores, which conflicts with this research that found no statistical difference between

genders. Schaufeli and Bakker argued, despite the difference between genders, the results “lack practical significance because their size is very small” (p. 18).

Schaufeli and Bakker (2004) also studied the relationship between age and work engagement of 9,516 participants and concluded older employees are more engaged, but the relationship between the variables is weak ( $r = .140$ ), and less than 2% of the variability in work engagement can be explained by age. As with differences in gender, Schaufeli et al. (2006) concluded “these correlations generally lacked practical significance” (p. 711).

The existing research does support the results of this study comparing organizational level and work engagement. This research found a statistically significant difference in work engagement between senior managers, middle managers, and employees. Senior level managers had the highest level of work engagement, whereas employee level participants had the lowest. Schaufeli et al. (2006) compared the work engagement of various professions that included managers, police officers, educators, and blue collar workers. A statistically significant difference between the professions was discovered that indicated blue collar workers were less engaged than those working as managers, police officers, and educators. Research by consulting organizations have also found managers, especially those working at senior levels, to score higher on engagement assessments in comparison to those working in non-management positions. Surveying over 35,000 U.S. employees, Towers Perrin (2003) reported 53% of senior executives were highly engaged versus only 12% of non-management hourly employees.

The intention to quit has been a popular research topic in relation to engagement. This research discovered participants with the highest work engagement scores were

those who had been in the same position more than 15 years, which suggests individuals who are highly engaged in their work may have less intention of leaving for another organization. Supporting research conducted by Harter et al. (2002) who completed a meta-analysis that was based on 7,939 business units in 36 companies, determined turnover had the second highest true score correlation to overall satisfaction and employee engagement that was preceded only by customer satisfaction-loyalty. Towers Perrin (2007) surveyed 90,000 employees in 18 countries and found 51% of engaged participants had no intentions to leave their current organization, whereas only 15% of those who were classified as disengaged felt the same way.

This research also determined educational levels effect work engagement. Participants with graduate degrees had the highest levels of engagement. Gfk Custom Research North America (2011) reported similar findings in a survey completed by 5,012 working adults in the U.S. Gfk reported employees with a Ph.D. had the highest engagement levels (38% were highly engaged) compared to employees with less than a high school degree who were the least engaged group (25% were highly engaged).

Summarizing the results of this study in comparison to previous work engagement research, both confirming and conflicting conclusions can be drawn (see Table 25). Gender and age differences, albeit small, are supported by the existing literature, in contrast to this study that found no significant differences in work engagement based on gender or age. The existing literature did support the conclusions of this research that found organizational level, tenure, and education to have an effect on work engagement. Senior managers, those with graduate degrees, and participants working in the same position for more than 15 years were all found to have the highest levels of work

engagement in comparison to those with lower level positions, and less education and tenure.

Table 25

*Summary of comparisons with previous work engagement research*

	This Research		Previous Research	
	Effect	No Effect	Effect	No Effect
Gender		X	X	
Age		X	X	
Education	X		X	
Tenure	X		X	
Org Level	X		X	

### Research Conclusions

A number of conclusions can be drawn from this research, specifically, answers to the question of what drives engagement in the work of process improvement experts. Emotional intelligence was found to have a positive relationship with work engagement. In addition, emotional intelligence was also found to predict a portion of the variability in work engagement. More specifically, the sub–element of managing emotions was found to have the strongest prediction to the work engagement sub–element of vigor. The results provide for an argument suggesting process improvement experts who can control their emotions are likely to find greater engagement in their work, and have the energy to mentally stay involved in their work even when challenges arise.

The connection between managing emotions and work engagement likely goes much further than being able to control emotion. Deci and Flaste (1995) argue, “human



emotions are a powerful source of energy for action” (p. 187). Emotions can trigger both positive and negative energy, but those who have the ability to manage emotion tend to have a positive perspective as illustrated by the participant’s responses to individual questions related to managing emotions (see Appendix K for individual answer responses). Having the ability to manage emotions comes from overcoming challenges and expecting a good outcome to arise from even the most difficult of situations. Individuals who can manage their emotions also have the ability to make their positive feelings last, and seek out activities that make them happy. They also capitalize on their ability to use the positive mood to overcome obstacles that may seem insurmountable.

Zeidner, Matthews and Roberts (2009) argued emotional intelligence may be important for dealing with what they called the “toxic” (p. 302) work environment that is becoming more common across the world, resulting in a loss of productivity, workplace violence, absenteeism, and illness. The authors suggested emotions used while on the job can provide information individuals can tap into that allows them to alter thinking and behavior that results in the ability to better handle organizational challenges in a more productive way.

Individuals with high emotional intelligence, especially the ability to manage their emotions, are likely to have the mental strength to stay positive even though they face a toxic environment from time to time. This is demonstrated by the high levels of vigor in the participant’s of this research that suggests they are mentally resilient and can persevere even when things do not go well. Having the ability to develop positive emotions and control them may provide an explanation for why those who can manage their emotions are more engaged in their work. Robinson, Rafferty, Maben, and West

(2005) argued, individuals, when they feel positive emotions, are better able to stay open-minded and have greater self-control, allowing for coping more effectively in a challenging work environment. Robinson (2006) suggested a work environment that is charged with positive emotions can lead to greater engagement, and Cooper (1997) argued that if emotions are managed they can lead to greater commitment, trust, and loyalty, which can result in higher productivity by both individuals, teams, and organizations. This research builds on the aforementioned arguments that individuals who can develop positive emotions and control them will likely be more engaged in their work, and may also help drive engagement in those working around them.

The demographic variables studied in this research offer a number of conclusions worthy of discussion. Age and gender differences in both emotional intelligence and work engagement provide material for researchers to study and debate, but both lack any practical significance since neither can be changed. Educational levels were found to have an effect on both emotional intelligence and work engagement, but little research offers insight into why the differences exist. A simple argument could be made that those with graduate degrees are more likely to have greater employment options, and hence work in an environment more conducive to engagement than those with lower levels of education who have fewer employment options. Emotional intelligence is harder to explain in relation to educational levels. The difference in emotional intelligence was the largest between those with less than an associate degree and participants with a graduate degree. Rahim and Malik (2010) argued those with higher education are able to deal better with changing situations that are often complex. The researchers also suggested higher educated individuals are better at expressing, using, and understanding emotions

than those who are less educated. This research provides support for the rationale given by Rahim and Malik. Specifically, questions related to perceiving emotions had the largest differences between the lowest educated group and the highest. These questions centered on the ability to understand non-verbal messages of others and the ones sent by the participant to others. The less educated participants' ability to relate to the experience of another person, and having the ability to understand why other people feel the way they do also had large differences from those in the highest educated group. The results suggest higher education may positively impact the ability to perceive and understand emotions.

The organizational level of individuals also demonstrated a significant difference in emotional intelligence and work engagement. Senior leaders were higher in emotional intelligence than those working as employees. Goleman's (1998) research suggested emotional intelligence is even more important than technical skills, and leads to greater individual effectiveness. His perspective suggested emotional intelligence is a series of emotional and social competencies that are characteristics that help distinguish average performers from "star performers" (Emmerling & Goleman, 2003, p. 17). Although the academic community has widely rejected many of the conclusions Goleman has put forth due to his lack of peer reviewed work, his argument that individuals who have the intelligence quotient (IQ) to become a leader may be able to transition into a star performer by having a strong self-awareness, the ability to regulate emotion, social awareness, and effective relationship management skills does seem to have merit. One could make the argument very few successful senior leaders do not possess the ability of truly knowing themselves (i.e. strengths, weaknesses, needs, drives). Senior leaders also

tend to have the ability to manage their emotions and possess the capacity to create an awareness of social situations (i.e. empathy, organizational awareness). The final competency of relationship management is, arguably, one of the most prominent skills most senior leaders possess that gives them the ability to communicate effectively, manage conflict, and work well in an environment that fosters collaboration and teamwork.

Work engagement levels of senior leaders may provide another pathway into understanding engagement. Senior managers participating in this research had significantly higher levels of work engagement than those individuals working as employees. If one simply compares the workday of a senior manager to a line employee the explanation for the disparity in work engagement may be better understood. The first element that comes to mind in comparing these groups is their difference in compensation, but as Towers Perrin (2003) and Wagner and Harter (2006) have discovered, compensation only takes engagement so far, and once an individual is fairly compensated little is left to be gained in relation to engagement. What then differentiates the level of engagement between the two groups? One answer suggests that the level of autonomy most senior managers enjoy is the differentiator that drives engagement. Line employees are typically involved in routine tasks each day that offer little variety or challenge. To the contrary, senior leaders spend much of their day working on tasks they enjoy and find challenging and rewarding. Deci and Flaste (1995) provided support for the argument suggesting autonomy is the primary driver of intrinsic motivation. The researchers argued that individuals, when given an autonomous environment to work in, will be self-motivated, which likely leads to greater work engagement.

This research also resulted in a number of unexpected findings. Six Sigma certification was found to have no effect on work engagement, and participants with no ASQ certification had significantly higher work engagement than those with certification. Both of these results suggest the opposite of what could be considered the “norm” in what it takes to advance in the corporate world. Arguably, those who pursue additional training and certification are individuals who want to succeed and truly enjoy their work. The results of this research suggest work engagement goes beyond individual technical skill development.

Summarizing the conclusions, this research offers a partial answer to the question of what drives work engagement. The research found emotional intelligence predicts a portion of work engagement, more specifically, the ability to manage emotions may be the key emotional driver to creating work engagement. Process improvement experts who can manage their emotions are likely to be more engaged in their work. The research also concluded education and organizational level have an effect on emotional intelligence and work engagement. Higher education may help individuals learn to deal with complexity that leads to better emotional skills. Senior level managers were also found to have the highest emotional intelligence, which may be a result of their emotional competency as described by Goleman (1998). Work engagement was also found to be higher for senior managers. The autonomy they have in their daily work is likely a key to why their engagement levels are higher than line employees. Higher education also had an effect on work engagement. Those individuals with graduate degrees are likely to have greater options for employment allowing for a higher probability of finding engaging work. Another possible explanation may be similar to the aforementioned

discussion of education levels and emotional intelligence. Graduate education requires students to work with complex issues that they must deal with successfully in order to graduate. The ability those with graduate degrees may possess to work in complex situations may explain why their engagement is higher than those with lower education levels who may become quickly frustrated in similar situations.

### **Implication of Findings**

This research has several implications for process improvement experts tasked with leading initiatives such as TQM and Lean Six Sigma. Successful Lean Six Sigma programs have been shown to rely heavily on employees who are empowered and motivated (Zu & Fredendall, 2009). This research provides a potential pathway to process improvement experts who want to better understand what leads to higher levels of work engagement, but having a better understanding will only take them to a higher level of awareness, which will likely yield little to no tangible results. To truly harness the findings of this research process improvement experts should work to develop their emotional intelligence, specifically their ability to manage emotions. By developing their ability to manage emotions they may be able to increase their level of work engagement that could lead to greater individual and organizational results. The challenge then lies in how to improve emotional intelligence.

Can emotional intelligence be improved? The debate as to whether emotional intelligence can be improved has developed since the concept began to emerge in the late 1990s. Some researchers have argued the similarities emotional intelligence has to personality implies genetics play a key role in emotional intelligence (McCrae, 2000),

which would suggest emotional intelligence might be difficult, if not impossible, to change. Emmerling and Goleman (2003) argued genetics likely play a key role, but even geneticists have challenged the naïve assumption that nurture has no effect on nature. Meany (2001) has also argued gene expression appears to be shaped by an individual's emotional and social experiences.

Research in the field of neuroscience has also provided an argument that emotional intelligence can be improved. The research of LeDoux (1996) indicated despite the consistent differences in an individual's activation patterns in their emotional circuitry, a plasticity exists. The hippocampus, amygdala, and prefrontal cortex, all of which are used in perception, management, and use of emotion, have been shown to have plasticity (Davidson, Jackson, & Kalin, 2000).

The research supports the proposition that emotional intelligence can be improved through targeted training techniques. Mindfulness training by Davidson, Kabat-Zinn et al. (2003) has shown that alterations in the brain center that regulate positive and negative emotion can be changed. The training provided by the researchers to R & D scientists at a biotech firm demonstrated they experienced less stress and felt more creative and excited about their work after an eight week training regimen.

The work of Boyatzis (2007) with MBA students at the Weatherhead School of Management at Case Western University offers another perspective on developing emotional intelligence through a structured process that aims to improve emotional competency. Boyatzis argued there are a set of competencies that all successful managers, professionals, and leaders have that include cognitive abilities (i.e. IQ), intrapersonal skills such as self-management, and interpersonal skills that focus on

relationships with others. The latter two are what Boyatzis described as emotional intelligence competencies.

The process of improvement prescribed by Boyatzis (2007) is what he described as “intentional change” (p. 33). Intentional change is “a desired change in an aspect of who you are (i.e. the Real) or who you want to be (i.e. the Ideal), or both” (p. 33). The model developed by Boyatzis consists of five stages of discovery that included:

1. Discovering who you want to be—your ideal self.
2. Discovering who you are, where your ideal self and real self are similar, and identifying the gaps that exists between the two.
3. Establishing a learning agenda to close the gaps.
4. Developing new behaviors, thoughts, and feelings that create new neural pathways that lead to mastery.
5. Creating trusting relationships that help and encourage each of the stages.

The results of Boyatzis’ (2007) work have yielded significant results in MBA students enrolled in the training coursework. Improvement in self-awareness and social awareness were shown to increase more than 40% and 70%, respectively, in the first two years after training. Boyatzis argued the results are much greater than the typical 2% increase in social and emotional competencies found in traditional MBA programs (Boyatzis, Cowan, & Kolb, 1995). The long-term results also demonstrated the improvements can be maintained. Even five to seven years later participants had maintained more than a 60% improvement in self-awareness and more than a 40% improvement in social awareness over the baseline measures.



Caruso and Salovey (2004) offered a pragmatic approach to becoming an emotionally intelligent leader. The researchers argued writing and exercising are two ways of developing the ability to manage emotions. The authors suggested the act of writing is not what is important. What is important is the element within the writing. Caruso and Salovey offered several suggestions for what they called “emotionally healthful writing” (p. 136). The elements included:

- Using positive words frequently.
- Moderate use of negative words.
- Using causal words and phrases such as “led me” or “caused me to”.
- Using insightful words and phrases such as “realize” and “understand”.

Caruso and Salovey (2004) suggested writing to a friend or using a journal to capture emotions. The authors also argued what you write about is not important, stating “you can write about any event that lets you explore your deepest emotions *and* thoughts” (p. 137). Exercise, suggested Caruso and Salovey, is another way to better manage emotions. Exercise has been shown to be a key element to managing mood (Thayer, 2001). The authors suggested one does not need to run or cycle for miles. Simply taking a short walk to collect your thoughts may be enough to help manage emotions.

Staying open to emotion, argued Caruso and Salovey (2004), is another technique that can be used to control emotions. The researchers argued, “if emotions contain valuable information, then being closed to this information can be harmful” (p. 138). Caruso and Salovey described a technique known as “systematic desensitization” (p. 138) that was developed by Wolpe (1958) as a method for staying open to emotion. The process includes the following steps:

1. Determine the emotions that cause you the most trouble.
2. Define a list of situations that create this emotion.
3. Rank the situations from the most to least emotionally intense.
4. Learn how to relax in these situations (i.e. muscle relaxation technique, exercise, writing).
5. Create a pleasant and calming mood and relax.

Summarizing the implications of this research, process improvement experts can take steps to improve their emotional intelligence that may lead to higher work engagement. The research in the field of neuroscience indicates the emotional centers within the brain have a plasticity that can be developed. The training methods described by Boyatzis (2007) and Caruso and Salovey (2004) provide guidance to process improvement experts seeking to improve emotional intelligence. Process improvement experts, especially those who are responsible for developing and executing Lean Six Sigma training, should also consider expanding their curriculums that tend to focus solely on the technical skills required for Lean Six Sigma (i.e. project management, statistics, data collection) to also include the emotional elements that may lead to greater engagement in projects, resulting in improved organizational performance.

### **Limitation, Delimitations, and Risks**

A number of limitations, delimitations, and risks were associated with this research. The limitations to this research were related to the instruments, the ability to generalize the results of the findings, and the limitations to the correlation, regression analysis, and ANOVA. While the instruments were considered acceptable for this

research they were limited by their validity and reliability. Another limitation related to the findings of this research is that the findings may not be generalized to individuals outside of the quality profession. The research was also delimited by the use of only U.S. and Canadian ASQ members.

Response bias was also a limitation of this research. Fowler (2002) described response bias as the effect non-responses may have on survey data. To check for response bias, wave analysis (Leslie, 1972) using ANOVA was conducted to compare early respondents (first week of survey) to late responders (last week of survey). Wave analysis helps in understanding if the results would have been the same if all participants invited to contribute would have done so. Creswell (2009) suggested late responders represent non-respondents, and if a change exists between early and late responders there is a chance of response bias.

The ANOVA results discussed in chapter four indicated no significant difference existed for emotional intelligence scores in participants in week one compared to week three. However, the work engagement scores did differ significantly between the weeks. Scores for the third week were significantly higher than the first week suggesting response bias may exist in work engagement scores. One potential explanation for this could be those responding in week three, after the reminder was emailed, were less likely to be distracted from their work because they are more engaged. Despite the increase in work engagement scores in week three participants, with the emotional intelligence scores not changing between weeks the overall impact to the correlation and regression results would have likely been the same even if the non-responders would have contributed.

Risks to this research included the management of individual participant response data and personal information, and the potential to cause harm to those responding. These risks were minimized by ensuring only the researcher had access to the data that was stored on a login/password protected laptop and survey site, and through the review and approval of the research by the George Fox University Human Subject Review Board before data collection began (see Appendix I). There was also a risk of gender bias if the sample demographics were not similar to overall U.S. and Canadian ASQ membership. The results of this research (61% male, 39% female) were similar to U.S. and Canadian ASQ member demographics, which are 68.7% male and 31.3% female (S. Sanders, personal communication, February 20, 2012), indicating the risk of gender bias is minimal.

### **Recommendations for Future Research**

This research provided a partial answer to what may drive work engagement. However, a large percentage of the variability in work engagement was not found to be predicted by the emotional intelligence of participants. What other factors are antecedents to work engagement? The gap in understanding provides impetus for future research.

Future research should also investigate how much an individual brings to building engagement, and what portion is driven by the organization. Research by Wollard and Shuck (2011) may provide direction in what to focus on. The researchers completed a comprehensive literature review and found 42 individual and organizational antecedents

discussed in the engagement literature, but just over half have been supported with empirical data (emotional intelligence was not amongst the individual antecedents).

The demographic variables found to effect work engagement also provide direction for future research. Questions still remain as to why those with higher education have higher emotional intelligence and work engagement. Is the process of pursuing a graduate degree also conducive to improving emotional intelligence? If so, what elements of graduate education might be applied to those outside of academia who want to improve their emotional intelligence? Also, why do those with graduate degrees have higher work engagement? Do the increased employment options those with graduate degrees often have factor into finding more engaging work?

This research also found that senior managers have high emotional intelligence and work engagement, which offers another focal point for future research. Why do they have higher emotional intelligence and work engagement? If, as was posited by Towers Perrin (2003), that the content of a senior manager's work (i.e. autonomy, flexibility, challenge) influences their engagement, how can those aspects of their work be replicated to those at lower organizational levels? In relation to senior manager's high levels of emotional intelligence, what is it about them that leads to higher emotional intelligence?

Future research should also study the relationship between emotional intelligence, work engagement, and the success of Lean Six Sigma programs. This research determined higher emotional intelligence predicted 17.3% of the variability in work engagement, which is arguably critical to the success of a Lean Six Sigma. Future research should consider the direct relationship emotional intelligence and work engagement may have to the results of quality improvement programs such as Lean Six

Sigma. The research should also include studying the effect of having emotional intelligence training as part of the Lean Six Sigma curriculum.

Much debate exists regarding the various instruments used to measure emotional intelligence (Zeidner et al., 2009). The instrument used in this research was chosen for its robustness and brevity, but other instruments such as the MSCEIT and EQ-i have also been popular choices for researchers. Future research replicating this study using one of the aforementioned instruments should be considered.

A final recommendation for future research is replicating this study with participants outside of the quality profession and/or who are not members of ASQ. The members of ASQ may not represent those who work in other professions, and if individuals who are not process improvement experts were to be studied the results might be different. Individuals from different countries may also provide an area for future research.

## **Conclusion**

This research utilized a quantitative approach to understanding the relationship between the emotional intelligence and work engagement of 5,187 U.S. and Canadian process improvement experts who were also members of ASQ. The results were statistically significant and indicated emotional intelligence predicted 17.3% of the variability in work engagement. While the percentage may seem small, consider the size of the problem and what even a minor improvement in work engagement could mean to organizational performance. Recent engagement research indicates disengaged employees make up nearly 35% of organizational payrolls that results in an annual cost of

\$340 billion dollars (Rivera & Flinck, 2011). The results of this research may not provide answers to the entire problem, but even a small portion could make a sizeable financial impact.

The research also indicated gender, education, and organizational level had a significant effect on emotional intelligence, whereas age was found to have no effect. Education, organizational level, years in current position, and not having an ASQ certification were also found to have a significant effect on work engagement, whereas age, gender, and having a Six Sigma certification had no effect.

Limitations and risks do exist with the research, but the findings, coupled with the existing literature, provide direction for process improvement experts seeking greater work engagement. The sad truth lies in the numbers describing the current state of disengagement with work. Clearly, a problem exists when the vast majority of individuals go to a job each day they have little passion for. Not only does the problem create a financial challenge to organizations and the customers they serve, but, arguably even more important, the problem leads to the potential of living a life without meaning. There is little doubt many will find meaning outside of their work, but for most, the time one spends on the job far outweighs time spent away from work. The hope is this research may guide those wanting to tap into their emotional intelligence some help in the development of creating a vigor, dedication, and absorption for and in their work.

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## Appendix A

### Leader Solicitation

*This email was sent soliciting the expert's participation in the research study.*

Dear %%First Name%%:

Research suggests the lack of employee engagement in the United States costs businesses over \$300 billion in lost productivity, and the average company has only 30% of employees who are highly engaged in their work. This lack of engagement leads to higher absenteeism and turnover, in addition to lower levels of quality.

To the contrary, organizations with a high ratio of engaged employees report higher levels of profitability and customer satisfaction. Practitioners and academics are still debating what drives engagement. What is known suggests individual differences, such as emotional intelligence, may influence engagement.

ASQ is conducting a brief survey on the emotional intelligence and engagement in quality professionals to help better understand the relationship between these concepts that may lead to a clearer understanding of how to improve engagement.

Thank you in advance for your help as we work to build the future of quality and meet tomorrow's critical organizational challenges.

To show our appreciation for contributing to this research a random drawing will be conducted to give away 20 ten dollar gift cards, and one lucky participant will receive an iPad 2.

*Source: Gallup Consulting, "Employee Engagement: A Leading Indicator of Financial Performance."*

*If you have trouble accessing the survey from this email, please copy and paste the following URL into your browser's address bar: <survey link here>, or contact the Market Research Administrator at [mrcoord@asq.org](mailto:mrcoord@asq.org).*

## Appendix B

### Informed Consent

*This was setup as a web page the participants were presented with after clicking the link in the solicitation email. They read through the following before taking the survey and selected "I agree" before being allowed to participate in the research project.*

Thank you for agreeing to be part of this research study. To participate in this research you must meet at least one of the following criteria:

- More than five years of experience working in process improvement
- Six Sigma certification
- ASQ certification

The central focus of this study is to gain a better understanding of the potential relationship between a emotional intelligence and work engagement.

The estimated time to complete the surveys is 10-15 minutes.

There are no associated risks with this study outside of the use of your time to contribute.

Your participation in this research is completely anonymous. Your email address is only required if you decide to participate in the prize drawings.

If you have any questions or concerns please contact the researcher using the contact information below.

Scott Thor  
sthor09@georgefox.edu  
661.204.9448

## Appendix C

### Demographic Survey

Which best describes your primary industry?

- Business, Secretarial, Vocational E
- Chemicals and Allied Products (including Pharmaceuticals) M
- Consulting/Business Services S
- Educational Services E
- Electronics M
- Elementary/Secondary (or K-12) E
- Entertainment/Hospitality/Recreation S
- Fabricated Metals M
- Financial/Insurance S
- Government G
- Higher Education E
- Hospitals H
- Industrial Machinery and Computer Equipment M
- Libraries E
- Measuring and Controlling Instruments M
- Medical and Dental Laboratories H
- Medical Devices M
- Miscellaneous Health and Allied Services H
- Offices and Clinics of Doctors of Medicine H
- Transportation (automotive, aerospace, and rail) M
- Transportation/Logistics Services S
- Wholesale/Retail S
- Other \_\_\_\_\_ O

*The participants answers will be grouped into one of six industry category*

1. M-Manufacturing
2. S-Services
3. H-Healthcare
4. E-Education
5. G-Government
6. O-Other

Which of the following best describes your title or function?

- Auditor
- Analyst
- Consultant
- Director
- Educator/Instructor
- Engineer
- Inspector
- Manager
- Master Black Belt
- Senior Officer (President/Vice President/CEO)
- Specialist
- Student
- Supervisor
- Technician
- Other \_\_\_\_\_

What is your current or most recent level of position?

- Employee
- Supervisor
- Manager
- Director
- Vice President
- President
- C-Level Executive (CEO, COO, CFO, etc.)
- Other

How many years of work experience do you have in quality and/or process improvement?

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- More than 15 years

How many years have you worked in your current position?

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- More than 15 years

What level of Six Sigma training have you completed?

- White Belt
- Yellow Belt
- Green Belt
- Black Belt
- Master Black Belt
- Champion
- Executive
- None

What ASQ certifications do you currently hold?

- Biomedical Auditor - CBA
- Calibration Technician - CCT
- HACCP Auditor - CHA
- Manager of Quality/Organizational Excellence - CMQ/OE
- Master Black Belt – CMBB
- Pharmaceutical GMP Professional - CPGP
- Quality Auditor - CQA
- Quality Engineer - CQE
- Quality Improvement Associate - CQIA
- Quality Inspector - CQI
- Quality Process Analyst - CQPA
- Quality Technician - CQT
- Reliability Engineer - CRE
- Six Sigma Black Belt - CSSBB
- Six Sigma Green Belt - CSSGB
- Software Quality Engineer – CSQE

What is your highest level of completed education?

- GED
- High School Diploma
- Vocational/Technical Certificate
- Vocational/Technical Degree
- Associate Degree
- Bachelor's Degree
- Master's Degree
- Doctorate

What is your gender?

- Male
- Female

What is your age?

- 18 or under
- 19 to 25
- 26 to 35
- 36 to 45
- 46 to 55
- 56 to 65
- Over 65



## Appendix D

### The Assessing Emotions Scale

**Directions:** Each of the following items asks you about your emotions or reactions associated with emotions. After deciding whether a statement is generally true for you, use the 5-point scale to respond to the statement. Please circle the “1” if you strongly disagree that this is like you, the “2” if you somewhat disagree that this is like you, “3” if you neither agree nor disagree that this is like you, the “4” if you somewhat agree that this is like you, and the “5” if you strongly agree that this is like you.

There are no right or wrong answers. Please give the response that best describes you.

- 1 = strongly disagree
- 2 = somewhat disagree
- 3 = neither agree nor disagree
- 4 = somewhat agree
- 5 = strongly agree

- |                                                                                                        |           |
|--------------------------------------------------------------------------------------------------------|-----------|
| 1. I know when to speak about my personal problems to others.                                          | 1 2 3 4 5 |
| 2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.       | 1 2 3 4 5 |
| 3. I expect that I will do well on most things I try.                                                  | 1 2 3 4 5 |
| 4. Other people find it easy to confide in me.                                                         | 1 2 3 4 5 |
| 5. I find it hard to understand the non-verbal messages of other people.                               | 1 2 3 4 5 |
| 6. Some of the major events of my life have led me to re-evaluate what is important and not important. | 1 2 3 4 5 |
| 7. When my mood changes, I see new possibilities.                                                      | 1 2 3 4 5 |
| 8. Emotions are one of the things that make my life worth living.                                      | 1 2 3 4 5 |
| 9. I am aware of my emotions as I experience them.                                                     | 1 2 3 4 5 |
| 10. I expect good things to happen.                                                                    | 1 2 3 4 5 |

11. I like to share my emotions with others. 1 2 3 4 5
12. When I experience a positive emotion, I know how to make it last. 1 2 3 4 5
13. I arrange events others enjoy. 1 2 3 4 5
14. I seek out activities that make me happy. 1 2 3 4 5
15. I am aware of the non-verbal messages I send to others. 1 2 3 4 5
16. I present myself in a way that makes a good impression on others. 1 2 3 4 5
17. When I am in a positive mood, solving problems is easy for me. 1 2 3 4 5
18. By looking at their facial expressions, I recognize the emotions people are experiencing. 1 2 3 4 5
19. I know why my emotions change. 1 2 3 4 5
20. When I am in a positive mood, I am able to come up with new ideas. 1 2 3 4 5
21. I have control over my emotions. 1 2 3 4 5
22. I easily recognize my emotions as I experience them. 1 2 3 4 5
23. I motivate myself by imagining a good outcome to tasks I take on. 1 2 3 4 5
24. I compliment others when they have done something well. 1 2 3 4 5
25. I am aware of the non-verbal messages other people send. 1 2 3 4 5
26. When another person tells me about an important event in his or her life, I almost feel as though I experienced this event myself. 1 2 3 4 5
27. When I feel a change in emotions, I tend to come up with new ideas. 1 2 3 4 5
28. When I am faced with a challenge, I give up because I believe I will fail. 1 2 3 4 5
29. I know what other people are feeling just by looking at them. 1 2 3 4 5

30. I help other people feel better when they are down. 1 2 3 4 5
31. I use good moods to help myself keep trying in the face of obstacles. 1 2 3 4 5
32. I can tell how people are feeling by listening to the tone of their voice. 1 2 3 4 5
33. It is difficult for me to understand why people feel the way they do. 1 2 3 4 5

## Appendix E

### Permission to use Assessing Emotions Scale

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## Re: Emotional Intelligence Dissertation

1 message

---

**Nicola Schutte** <nshutte@pobox.une.edu.au>  
To: Scott Thor <sthor09@georgefox.edu>

Mon, May 30, 2011 at 4:34 PM

Thanks for your message. Your research sounds interesting. You are welcome to use the scale. Please find attached a manuscript version of a published chapter that contains background information.

Kind regards,  
Nicola Schutte

At 05:11 29/05/2011, you wrote:

>Dr. Schutte,

>

>I am in the process of starting my doctoral dissertation at George Fox University and want to see if you could provide me with some additional information on how to use your instrument to measure emotional intelligence. My proposal is studying the relationship between emotional intelligence and work engagement. I will be using the Utrecht Work Engagement Scale to measure work engagement, and your instrument looks promising for measuring emotional intelligence with a much shorter instrument than the others I have been researching. I would greatly appreciate any information you could pass along as I start this process, and also what is needed to gain permission to use the instrument if I select it for my research.

>

>Sincerely,


>

>Scott Thor

---

Associate Professor Nicola Schutte  
Psychology  
School of Behavioural, Cognitive and Social Sciences  
University of New England  
Armidale, NSW 2351  
Australia

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 **Assessing Emotions Scale Chapter published manuscript version.doc**  
176K

## Appendix F

### The Utrecht Work Engagement Scale

#### Work & Well-being Survey (UWES) ©

The following 17 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the "0" (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

0	Almost never	Rarely	Sometimes	Often	Very often	Always
	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

1. \_\_\_\_\_ At my work, I feel bursting with energy
2. \_\_\_\_\_ I find the work that I do full of meaning and purpose
3. \_\_\_\_\_ Time flies when I'm working
4. \_\_\_\_\_ At my job, I feel strong and vigorous
5. \_\_\_\_\_ I am enthusiastic about my job
6. \_\_\_\_\_ When I am working, I forget everything else around me
7. \_\_\_\_\_ My job inspires me
8. \_\_\_\_\_ When I get up in the morning, I feel like going to work
9. \_\_\_\_\_ I feel happy when I am working intensely
10. \_\_\_\_\_ I am proud of the work that I do
11. \_\_\_\_\_ I am immersed in my work
12. \_\_\_\_\_ I can continue working for very long periods at a time
13. \_\_\_\_\_ To me, my job is challenging
14. \_\_\_\_\_ I get carried away when I'm working
15. \_\_\_\_\_ At my job, I am very resilient, mentally
16. \_\_\_\_\_ It is difficult to detach myself from my job
17. \_\_\_\_\_ At my work I always persevere, even when things do not go well

© Schaufeli & Bakker (2003). The Utrecht Work Engagement Scale is free for use for non-commercial scientific research. Commercial and/or non-scientific use is prohibited, unless previous written permission is granted by the authors

## Appendix G

### Permission to use Utrecht Work Engagement Scale

#### Notice for potential users of the UWES and the DUWAS

- You are welcomed to use both tests provided that you agree to the following two conditions:
  1. The use is for non-commercial educational or research purposes only. This means that no one is charging anyone a fee.
  2. You agree to share some of your data, detailed below, with the authors. We will add these data to our international database and use them only for the purpose of further validating the UWES (e.g., updating norms, assessing cross-national equivalence).
- Data to be shared:

For each sample, the raw test-scores, age, gender, and (if available) occupation. Please adhere to the original answering format and sequential order of the items.  
For each sample a brief narrative description of its size, occupation(s) covered, language, and country.
- Please send data to: [w.schaufeli@uu.nl](mailto:w.schaufeli@uu.nl). Preferably the raw data file should be in SPSS or EXCEL format.
- By continuing to the [test forms](#) you agree with the above statement.

### Appendix H

#### Previous Studies Using The Assessing Emotions Scale

Author(s)	Participants	Reliability	Mean Emotional Intelligence	Standard Deviation
Bastian, Burns, and Nettelbeck (2005)	246 college students	.89	123.8	12.5
Brackett and Mayer (2003)	207 college students	.93	123.4	14.5
Brown and Schutte (2006)	167 college students	.85	126.5	11.6
Carmeli (2003)	98 managers	.90	122.4	12.2
Carmeli and Josman (2006)	215 employees	.83	126.4	12.2
Charbonneau and Nicol (2002)	134 teenagers	.84	124.4	14.5
Ciarrochi, Chan, and Bajgar (2000)	131 teenagers	.84	120.5	13.9
Depape, Hakim-Larson, Voelker, Page, and Jackson (2006)	125 college students	.85	127.8	12.4
Liau, Liau, Teoh, and Liau (2003)	203 teenagers	.76	132.1	11.1
Newcombe and Ashkanasy (2002)	537 business college students	.88	94.6	13.6
Pau and Croucher (2003)	223 college students	.90	117.5	14.9
Schutte, Malouff, Hall, Haggerty, Cooper, Golden and Dornheim (1998)	346 individuals for general pop and college students	.90	128.9	15.6

---

Totterdell and Holman (2003)	18 customer service employees	.89	127.4	13.7
Van Rooy, Alonso, and Viswesvaran (2005)	275 college students	.87	129.5	14.2

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## Appendix I

## Human Subjects Review Form

GEORGE FOX UNIVERSITY  
HSRC INITIAL REVIEW QUESTIONNAIRE  
Page 6

Title:

Organizational Excellence: A Study of the Relationship Between Emotional Intelligence  
and Work Engagement in Process Improvement Experts

Principal

Researcher(s): Scott Thor

Date application completed: \_\_\_\_\_

**COMMITTEE FINDING:**

1) The proposed research makes adequate provision for safeguarding the health and dignity of the subjects and is therefore approved.

2) Due to the assessment of risk being questionable or being subject to change, the research must be periodically reviewed by the HRSC on a \_\_\_\_\_ basis throughout the course of the research or until otherwise notified. This requires resubmission of this form, with updated information, for each periodic review.

3) The proposed research evidences some unnecessary risk to participants and therefore must be revised to remedy the following specific area(s) of non-compliance:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4) The proposed research contains serious and potentially damaging risks to subjects and is therefore not approved.

Chair or designated member Cony Kuro Date 12/20/11

## Appendix J

### Hypothesis Summary

#### Hypotheses 1 – 4 Emotional Intelligence vs. Work Engagement

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>1</sub>	H <sub>01</sub> : Process improvement experts with high and low <i>emotional intelligence</i> will have no difference in levels of <i>work engagement</i> .  H <sub>a1</sub> : Process improvement experts with high <i>emotional intelligence</i> will have higher levels of <i>work engagement</i> .	Reject	Accept
H <sub>2</sub>	H <sub>02</sub> : Process improvement experts with high and low <i>emotional intelligence</i> will have no difference in levels of <i>vigor</i> .  H <sub>a2</sub> : Process improvement experts with high <i>emotional intelligence</i> will have higher levels of <i>vigor</i> .	Reject	Accept
H <sub>3</sub>	H <sub>03</sub> : Process improvement experts with high and low <i>emotional intelligence</i> will have no difference in levels of <i>dedication</i> .  H <sub>a3</sub> : Process improvement experts with high <i>emotional intelligence</i> will have higher levels of <i>dedication</i> .	Reject	Accept
H <sub>4</sub>	H <sub>04</sub> : Process improvement experts with high and low <i>emotional intelligence</i> will have no difference in levels of <i>absorption</i> .  H <sub>a4</sub> : Process improvement experts with high <i>emotional intelligence</i> will have higher levels of <i>absorption</i> .	Reject	Accept

## Hypotheses 5 – 8 Ability to Perceive Emotions vs. Work Engagement

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>5</sub>	H <sub>05</sub> : Process improvement experts with a high and low <i>ability to perceive emotions</i> will have no difference in levels of <i>work engagement</i> .  H <sub>a5</sub> : Process improvement experts with a high <i>ability to perceive emotions</i> will have higher levels of <i>work engagement</i> .	Reject	Accept
H <sub>6</sub>	H <sub>06</sub> : Process improvement experts with a high and low <i>ability to perceive emotions</i> will have no difference in levels of <i>vigor</i> .  H <sub>a6</sub> : Process improvement experts with a high <i>ability to perceive emotions</i> will have higher levels of <i>vigor</i> .	Reject	Accept
H <sub>7</sub>	H <sub>07</sub> : Process improvement experts with a high and low <i>ability to perceive emotions</i> will have no difference in levels of <i>dedication</i> .  H <sub>a7</sub> : Process improvement experts with a high <i>ability to perceive emotions</i> will have higher levels of <i>dedication</i> .	Reject	Accept
H <sub>8</sub>	H <sub>08</sub> : Process improvement experts with a high and low <i>ability to perceive emotions</i> will have no difference in levels of <i>absorption</i> .  H <sub>a8</sub> : Process improvement experts with a high <i>ability to perceive emotions</i> will have higher levels of <i>absorption</i> .	Reject	Accept

## Hypotheses 9 – 12 Ability to Use Emotions vs. Work Engagement

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>9</sub>	H <sub>09</sub> : Process improvement experts with a high and low <i>ability to use emotion to facilitate thought</i> will have no difference in levels of <i>work engagement</i> .  H <sub>a9</sub> : Process improvement experts with a high <i>ability to use emotion to facilitate thought</i> will have higher levels of <i>work engagement</i> .	Reject	Accept
H <sub>10</sub>	H <sub>010</sub> : Process improvement experts with a high and low <i>ability to use emotion to facilitate thought</i> will have no difference in levels of <i>vigor</i> .  H <sub>a10</sub> : Process improvement experts with a high <i>ability to use emotion to facilitate thought</i> will have higher levels of <i>vigor</i> .	Reject	Accept
H <sub>11</sub>	H <sub>011</sub> : Process improvement experts with a high and low <i>ability to use emotion to facilitate thought</i> will have no difference in levels of <i>dedication</i> .  H <sub>a11</sub> : Process improvement experts with a high <i>ability to use emotion to facilitate thought</i> will have higher levels of <i>dedication</i> .	Reject	Accept
H <sub>12</sub>	H <sub>012</sub> : Process improvement experts with a high and low <i>ability to use emotion to facilitate thought</i> will have no difference in levels of <i>absorption</i> .  H <sub>a12</sub> : Process improvement experts with a high <i>ability to use emotion to facilitate thought</i> will have higher levels of <i>absorption</i> .	Reject	Accept

## Hypotheses 13 – 16 Ability to Understand Emotions vs. Work Engagement

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>13</sub>	H <sub>013</sub> : Process improvement experts with a high and low <i>ability to understand emotions</i> will have no difference in levels of <i>work engagement</i> .  H <sub>a13</sub> : Process improvement experts with a high <i>ability to understand emotions</i> will have higher levels of <i>work engagement</i> .	Reject	Accept
H <sub>14</sub>	H <sub>014</sub> : Process improvement experts with a high and low <i>ability to understand emotions</i> will have no difference in levels of <i>vigor</i> .  H <sub>a14</sub> : Process improvement experts with a high <i>ability to understand emotions</i> will have higher levels of <i>vigor</i> .	Reject	Accept
H <sub>15</sub>	H <sub>015</sub> : Process improvement experts with a high and low <i>ability to understand emotions</i> will have no difference in levels of <i>dedication</i> .  H <sub>a15</sub> : Process improvement experts with a high <i>ability to understand emotions</i> will have higher levels of <i>dedication</i> .	Reject	Accept
H <sub>16</sub>	H <sub>016</sub> : Process improvement experts with a high and low <i>ability to understand emotions</i> will have no difference in levels of <i>absorption</i> .  H <sub>a16</sub> : Process improvement experts with a high <i>ability to understand emotions</i> will have higher levels of <i>absorption</i> .	Reject	Accept

## Hypotheses 17 – 20 Ability to Manage Emotions vs. Work Engagement

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>17</sub>	H <sub>017</sub> : Process improvement experts with a high and low <i>ability to manage emotions</i> will have no difference in levels of <i>work engagement</i> .  H <sub>a17</sub> : Process improvement experts with a high <i>ability to manage emotions</i> will have higher levels of <i>work engagement</i> .	Reject	Accept
H <sub>18</sub>	H <sub>018</sub> : Process improvement experts with a high and low <i>ability to manage emotions</i> will have no difference in levels of <i>vigor</i> .  H <sub>a18</sub> : Process improvement experts with a high <i>ability to manage emotions</i> will have higher levels of <i>vigor</i> .	Reject	Accept
H <sub>19</sub>	H <sub>019</sub> : Process improvement experts with a high and low <i>ability to manage emotions</i> will have no difference in levels of <i>dedication</i> .  H <sub>a19</sub> : Process improvement experts with a high <i>ability to manage emotions</i> will have higher levels of <i>dedication</i> .	Reject	Accept
H <sub>20</sub>	H <sub>020</sub> : Process improvement experts with a high and low <i>ability to manage emotions</i> will have no difference in levels of <i>absorption</i> .  H <sub>a20</sub> : Process improvement experts with a high <i>ability to manage emotions</i> will have higher levels of <i>absorption</i> .	Reject	Accept

## Hypotheses 21 – 24 Emotional Intelligence vs. Demographics

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>21</sub>	H <sub>021</sub> : There is no significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>age</i> .  Hypothesis H <sub>a21</sub> : There is a significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>age</i> .	Fail to Reject	-
H <sub>22</sub>	H <sub>022</sub> : There is no significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>gender</i> .  Hypothesis H <sub>a22</sub> : There is a significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>gender</i> .	Reject	Accept
H <sub>23</sub>	H <sub>023</sub> : There is no significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>education</i> .  Hypothesis H <sub>a23</sub> : There is a significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>education</i> .	Reject	Accept
H <sub>24</sub>	H <sub>024</sub> : There is no significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>organizational level</i> .  Hypothesis H <sub>a24</sub> : There is a significant difference in process improvement expert's <i>emotional intelligence</i> based on <i>organizational level</i> .	Reject	Accept

## Hypotheses 25 – 31 Work Engagement vs. Demographics

Hypothesis	Description	H <sub>0</sub>	H <sub>a</sub>
H <sub>25</sub>	H <sub>025</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>age</i> .  Hypothesis H <sub>a25</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>age</i> .	Fail to Reject	-
H <sub>26</sub>	H <sub>026</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>gender</i> .  Hypothesis H <sub>a26</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>gender</i> .	Fail to Reject	-
H <sub>27</sub>	H <sub>027</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>education</i> .  Hypothesis H <sub>a27</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>education</i> .	Reject	Accept
H <sub>28</sub>	H <sub>028</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>organizational level</i> .  Hypothesis H <sub>a28</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>organizational level</i> .	Reject	Accept
H <sub>29</sub>	H <sub>029</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>years in current position</i> .  Hypothesis H <sub>a29</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>years in current position</i> .	Reject	Accept



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H <sub>30</sub>	H <sub>030</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>Six Sigma certification</i> .  Hypothesis H <sub>a30</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>Six Sigma certification</i> .	Fail to Reject	-
H <sub>31</sub>	H <sub>031</sub> : There is no significant difference in process improvement expert's <i>work engagement</i> based on <i>ASQ certification</i> .  Hypothesis H <sub>a31</sub> : There is a significant difference in process improvement expert's <i>work engagement</i> based on <i>ASQ certification</i> .	Reject	Accept

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## Appendix K

### Assessing Emotions Scale Individual Question Response Data

Data in this appendix includes only demographic characteristics used in ANOVA analysis. What is not included are participants who reported organizational level as “other” ( $n = 311$ ) and were age 18 and under ( $n = 1$ ). Question numbers are coded as EI - <question number> - <EI sub-element>. Sub-elements include perception of emotion (POE), managing self emotions (MSE), managing others’ emotions (MOE), and utilization of emotions (UOE). Reverse scored questions are noted as (R).

<b>1. I know when to speak about my personal problems to others.</b>									
EI-Q1-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.30	0.92	350	6.75%	286	5.51%	4551	87.74%
<b>Gender</b>									
Female	2021	4.39	0.86	109	5.39%	83	4.11%	1829	90.50%
Male	3166	4.24	0.94	241	7.61%	203	6.41%	2722	85.98%
<b>Org Level</b>									
Employee	1734	4.26	0.91	121	6.98%	104	6.00%	1509	87.02%
Mid Mgmt	2270	4.28	0.93	166	7.31%	120	5.29%	1984	87.40%
Sr Mgmt	872	4.40	0.87	47	5.39%	38	4.36%	787	90.25%
<b>Age</b>									
19 – 25 (early)	61	4.15	1.03	6	9.84%	4	6.56%	51	83.61%
26 – 35 (early)	612	4.25	0.88	42	6.86%	32	5.23%	538	87.91%
36 – 45 (mid)	1274	4.31	0.87	80	6.28%	58	4.55%	1136	89.17%
46 – 55 (mid)	1959	4.29	0.94	145	7.40%	112	5.72%	1702	86.88%
56 – 65 (late)	1120	4.34	0.91	64	5.71%	63	5.63%	993	88.66%
Over 65 (late)	160	4.22	0.99	13	8.13%	17	10.63%	130	81.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.30	0.90	19	5.86%	26	8.02%	279	86.11%
Tech (Grp 1)	287	4.22	0.93	20	6.97%	22	7.67%	245	85.37%
Associate (Grp 2)	402	4.26	0.95	32	7.96%	21	5.22%	349	86.82%
Bachelor’s (Grp 2)	2187	4.29	0.90	143	6.54%	128	5.85%	1916	87.61%
Master’s (Grp 3)	1789	4.33	0.92	122	6.82%	73	4.08%	1594	89.10%
Doctorate (Grp 3)	198	4.26	0.97	14	7.07%	16	8.08%	168	84.85%

**2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.**  
EI-Q2-MSE

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.34	0.80	214	4.13%	210	4.05%	4763	91.83%
<b>Gender</b>									
Female	2021	4.34	0.81	89	4.40%	86	4.26%	1846	91.34%
Male	3166	4.35	0.79	125	3.95%	124	3.92%	2917	92.14%
<b>Org Level</b>									
Employee	1734	4.30	0.79	73	4.21%	86	4.96%	1575	90.83%
Mid Mgmt	2270	4.35	0.81	100	4.41%	82	3.61%	2088	91.98%
Sr Mgmt	872	4.44	0.77	28	3.21%	24	2.75%	820	94.04%
<b>Age</b>									
19 – 25 (early)	61	4.13	0.94	5	8.20%	5	8.20%	51	83.61%
26 – 35 (early)	612	4.33	0.76	26	4.25%	23	3.76%	563	91.99%
36 – 45 (mid)	1274	4.31	0.80	58	4.55%	48	3.77%	1168	91.68%
46 – 55 (mid)	1959	4.35	0.82	84	4.29%	83	4.24%	1792	91.48%
56 – 65 (late)	1120	4.40	0.77	36	3.21%	47	4.20%	1037	92.59%
Over 65 (late)	160	4.40	0.77	5	3.13%	4	2.50%	151	94.38%
<b>Education</b>									
GED/HS (Grp 1)	324	4.26	0.89	18	5.56%	22	6.79%	284	87.65%
Tech (Grp 1)	287	4.34	0.73	9	3.14%	10	3.48%	268	93.38%
Associate (Grp 2)	402	4.28	0.88	21	5.22%	25	6.22%	356	88.56%
Bachelor's (Grp 2)	2187	4.34	0.79	94	4.30%	69	3.16%	2024	92.55%
Master's (Grp 3)	1789	4.37	0.79	68	3.80%	75	4.19%	1646	92.01%
Doctorate (Grp 3)	198	4.43	0.74	4	2.02%	9	4.55%	185	93.43%

**3. I expect that I will do well on most things I try.**  
EI-Q3-MSE

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.40	0.74	139	2.68%	232	4.47%	4816	92.85%
<b>Gender</b>									
Female	2021	4.38	0.74	56	2.77%	91	4.50%	1874	92.73%
Male	3166	4.41	0.74	83	2.62%	141	4.45%	2942	92.92%
<b>Org Level</b>									
Employee	1734	4.35	0.75	52	3.00%	104	6.00%	1578	91.00%
Mid Mgmt	2270	4.41	0.73	57	2.51%	86	3.79%	2127	93.70%
Sr Mgmt	872	4.52	0.69	16	1.83%	21	2.41%	835	95.76%
<b>Age</b>									
19 – 25 (early)	61	4.26	0.89	4	6.56%	3	4.92%	54	88.52%
26 – 35 (early)	612	4.45	0.72	15	2.45%	30	4.90%	567	92.65%
36 – 45 (mid)	1274	4.37	0.75	34	2.67%	57	4.47%	1183	92.86%
46 – 55 (mid)	1959	4.41	0.73	48	2.45%	81	4.13%	1830	93.42%
56 – 65 (late)	1120	4.40	0.76	33	2.95%	52	4.64%	1035	92.41%
Over 65 (late)	160	4.36	0.76	5	3.13%	9	5.63%	146	91.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.29	0.77	11	3.40%	18	5.56%	295	91.05%
Tech (Grp 1)	287	4.36	0.66	4	1.39%	11	3.83%	272	94.77%
Associate (Grp 2)	402	4.30	0.85	18	4.48%	24	5.97%	360	89.55%
Bachelor's (Grp 2)	2187	4.39	0.73	57	2.61%	98	4.48%	2032	92.91%
Master's (Grp 3)	1789	4.46	0.72	41	2.29%	72	4.02%	1676	93.68%
Doctorate (Grp 3)	198	4.38	0.82	8	4.04%	9	4.55%	181	91.41%

<b>4. Other people find it easy to confide in me.</b>									
EI-Q4-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.18	0.84	226	4.36%	615	11.86%	4346	83.79%
<b>Gender</b>									
Female	2021	4.29	0.81	69	3.41%	184	9.10%	1768	87.48%
Male	3166	4.10	0.85	157	4.96%	431	13.61%	2578	81.43%
<b>Org Level</b>									
Employee	1734	4.16	0.86	76	4.38%	238	13.73%	1420	81.89%
Mid Mgmt	2270	4.17	0.84	99	4.36%	256	11.28%	1915	84.36%
Sr Mgmt	872	4.24	0.78	32	3.67%	76	8.72%	764	87.61%
<b>Age</b>									
19 – 25 (early)	61	3.97	0.93	2	3.28%	15	24.59%	44	72.13%
26 – 35 (early)	612	4.28	0.79	22	3.59%	50	8.17%	540	88.24%
36 – 45 (mid)	1274	4.22	0.83	53	4.16%	130	10.20%	1091	85.64%
46 – 55 (mid)	1959	4.17	0.81	73	3.73%	245	12.51%	1641	83.77%
56 – 65 (late)	1120	4.09	0.90	65	5.80%	154	13.75%	901	80.45%
Over 65 (late)	160	4.13	0.93	11	6.88%	21	13.13%	128	80.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.19	0.87	14	4.32%	41	12.65%	269	83.02%
Tech (Grp 1)	287	4.25	0.81	11	3.83%	31	10.80%	245	85.37%
Associate (Grp 2)	402	4.19	0.86	19	4.73%	49	12.19%	334	83.08%
Bachelor's (Grp 2)	2187	4.18	0.82	83	3.80%	270	12.35%	1834	83.86%
Master's (Grp 3)	1789	4.16	0.87	93	5.20%	197	11.01%	1499	83.79%
Doctorate (Grp 3)	198	4.12	0.81	6	3.03%	27	13.64%	165	83.33%

<b>5. I find it hard to understand the non-verbal messages of other people.</b>									
EI-Q5-POE(R)									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.58	1.14	3248	62.62%	697	13.44%	1242	23.94%
<b>Gender</b>									
Female	2021	3.78	1.12	1421	70.31%	197	9.75%	403	19.94%
Male	3166	3.45	1.13	1827	57.71%	500	15.79%	839	26.50%
<b>Org Level</b>									
Employee	1734	3.46	1.14	1013	58.42%	249	14.36%	472	27.22%
Mid Mgmt	2270	3.59	1.13	1439	63.39%	298	13.13%	533	23.48%
Sr Mgmt	872	3.78	1.12	609	69.84%	101	11.58%	162	18.58%
<b>Age</b>									
19 – 25 (early)	61	3.61	1.16	39	63.93%	6	9.84%	16	26.23%
26 – 35 (early)	612	3.72	1.11	422	68.95%	66	10.78%	124	20.26%
36 – 45 (mid)	1274	3.65	1.13	823	64.60%	177	13.89%	274	21.51%
46 – 55 (mid)	1959	3.57	1.12	1226	62.58%	260	13.27%	473	24.14%
56 – 65 (late)	1120	3.49	1.16	655	58.48%	166	14.82%	299	26.70%
Over 65 (late)	160	3.25	1.22	82	51.25%	22	13.75%	56	35.00%
<b>Education</b>									
GED/HS (Grp 1)	324	3.40	1.13	180	55.56%	51	15.74%	93	28.70%
Tech (Grp 1)	287	3.50	1.05	169	58.89%	49	17.07%	69	24.04%
Associate (Grp 2)	402	3.44	1.16	225	55.97%	66	16.42%	111	27.61%
Bachelor's (Grp 2)	2187	3.60	1.11	1398	63.92%	291	13.31%	498	22.77%
Master's (Grp 3)	1789	3.61	1.17	1144	63.95%	209	11.68%	436	24.37%
Doctorate (Grp 3)	198	3.75	1.13	132	66.67%	31	15.66%	35	17.68%

6. Some of the major events of my life have led me to re-evaluate what is important and not important.									
EI-Q6-UOE	n	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				n	%	n	%	n	%
<b>Total</b>	5187	4.45	0.81	185	3.57%	299	5.76%	4703	90.67%
<b>Gender</b>									
Female	2021	4.55	0.74	54	2.67%	88	4.35%	1879	92.97%
Male	3166	4.39	0.84	131	4.14%	211	6.66%	2824	89.20%
<b>Org Level</b>									
Employee	1734	4.46	0.80	61	3.52%	108	6.23%	1565	90.25%
Mid Mgmt	2270	4.43	0.82	83	3.66%	128	5.64%	2059	90.70%
Sr Mgmt	872	4.47	0.76	26	2.98%	42	4.82%	804	92.20%
<b>Age</b>									
19 – 25 (early)	61	4.30	0.88	3	4.92%	5	8.20%	53	86.89%
26 – 35 (early)	612	4.40	0.80	24	3.92%	40	6.54%	548	89.54%
36 – 45 (mid)	1274	4.47	0.76	38	2.98%	71	5.57%	1165	91.44%
46 – 55 (mid)	1959	4.48	0.79	61	3.11%	112	5.72%	1786	91.17%
56 – 65 (late)	1120	4.41	0.88	52	4.64%	58	5.18%	1010	90.18%
Over 65 (late)	160	4.41	0.90	7	4.38%	12	7.50%	141	88.13%
<b>Education</b>									
GED/HS (Grp 1)	324	4.39	0.86	11	3.40%	31	9.57%	282	87.04%
Tech (Grp 1)	287	4.41	0.83	11	3.83%	14	4.88%	262	91.29%
Associate (Grp 2)	402	4.55	0.75	10	2.49%	17	4.23%	375	93.28%
Bachelor's (Grp 2)	2187	4.44	0.81	85	3.89%	122	5.58%	1980	90.53%
Master's (Grp 3)	1789	4.45	0.80	62	3.47%	99	5.53%	1628	91.00%
Doctorate (Grp 3)	198	4.45	0.83	6	3.03%	16	8.08%	176	88.89%

7. When my mood changes, I see new possibilities.									
EI-Q7-UOE	n	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				n	%	n	%	n	%
<b>Total</b>	5187	3.62	0.92	589	11.36%	1499	28.90%	3099	59.75%
<b>Gender</b>									
Female	2021	3.73	0.90	191	9.45%	513	25.38%	1317	65.17%
Male	3166	3.55	0.93	398	12.57%	986	31.14%	1782	56.29%
<b>Org Level</b>									
Employee	1734	3.66	0.91	185	10.67%	480	27.68%	1069	61.65%
Mid Mgmt	2270	3.58	0.94	282	12.42%	665	29.30%	1323	58.28%
Sr Mgmt	872	3.67	0.89	85	9.75%	244	27.98%	543	62.27%
<b>Age</b>									
19 – 25 (early)	61	3.85	0.98	6	9.84%	10	16.39%	45	73.77%
26 – 35 (early)	612	3.76	0.93	62	10.13%	146	23.86%	404	66.01%
36 – 45 (mid)	1274	3.69	0.92	128	10.05%	329	25.82%	817	64.13%
46 – 55 (mid)	1959	3.58	0.91	237	12.10%	576	29.40%	1146	58.50%
56 – 65 (late)	1120	3.53	0.93	138	12.32%	382	34.11%	600	53.57%
Over 65 (late)	160	3.56	0.88	18	11.25%	55	34.38%	87	54.38%
<b>Education</b>									
GED/HS (Grp 1)	324	3.64	0.93	37	11.42%	94	29.01%	193	59.57%
Tech (Grp 1)	287	3.68	0.81	20	6.97%	87	30.31%	180	62.72%
Associate (Grp 2)	402	3.55	0.95	53	13.18%	118	29.35%	231	57.46%
Bachelor's (Grp 2)	2187	3.62	0.92	248	11.34%	630	28.81%	1309	59.85%
Master's (Grp 3)	1789	3.63	0.94	209	11.68%	509	28.45%	1071	59.87%
Doctorate (Grp 3)	198	3.62	0.92	22	11.11%	61	30.81%	115	58.08%

<b>8. Emotions are one of the things that make my life worth living.</b>									
EI-Q8-UOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.81	1.00	542	10.45%	1169	22.54%	3476	67.01%
<b>Gender</b>									
Female	2021	3.86	0.99	191	9.45%	439	21.72%	1391	68.83%
Male	3166	3.77	1.02	351	11.09%	730	23.06%	2085	65.86%
<b>Org Level</b>									
Employee	1734	3.78	1.02	192	11.07%	410	23.64%	1132	65.28%
Mid Mgmt	2270	3.81	0.98	228	10.04%	508	22.38%	1534	67.58%
Sr Mgmt	872	3.87	0.99	84	9.63%	180	20.64%	608	69.72%
<b>Age</b>									
19 – 25 (early)	61	3.90	1.06	9	14.75%	10	16.39%	42	68.85%
26 – 35 (early)	612	3.84	0.97	51	8.33%	150	24.51%	411	67.16%
36 – 45 (mid)	1274	3.82	1.00	135	10.60%	283	22.21%	856	67.19%
46 – 55 (mid)	1959	3.76	1.01	223	11.38%	455	23.23%	1281	65.39%
56 – 65 (late)	1120	3.85	0.99	104	9.29%	247	22.05%	769	68.66%
Over 65 (late)	160	3.86	1.07	20	12.50%	24	15.00%	116	72.50%
<b>Education</b>									
GED/HS (Grp 1)	324	3.83	0.99	33	10.19%	75	23.15%	216	66.67%
Tech (Grp 1)	287	3.69	1.00	33	11.50%	73	25.44%	181	63.07%
Associate (Grp 2)	402	3.73	1.06	47	11.69%	98	24.38%	257	63.93%
Bachelor's (Grp 2)	2187	3.79	1.00	226	10.33%	512	23.41%	1449	66.26%
Master's (Grp 3)	1789	3.86	1.00	181	10.12%	369	20.63%	1239	69.26%
Doctorate (Grp 3)	198	3.83	1.00	22	11.11%	42	21.21%	134	67.68%

<b>9. I am aware of my emotions as I experience them.</b>									
EI-Q9-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.23	0.81	276	5.32%	269	5.19%	4642	89.49%
<b>Gender</b>									
Female	2021	4.30	0.79	97	4.80%	65	3.22%	1859	91.98%
Male	3166	4.18	0.81	179	5.65%	204	6.44%	2783	87.90%
<b>Org Level</b>									
Employee	1734	4.21	0.81	97	5.59%	93	5.36%	1544	89.04%
Mid Mgmt	2270	4.22	0.81	122	5.37%	121	5.33%	2027	89.30%
Sr Mgmt	872	4.32	0.76	37	4.24%	35	4.01%	800	91.74%
<b>Age</b>									
19 – 25 (early)	61	4.07	0.93	6	9.84%	3	4.92%	52	85.25%
26 – 35 (early)	612	4.27	0.76	27	4.41%	26	4.25%	559	91.34%
36 – 45 (mid)	1274	4.23	0.82	71	5.57%	63	4.95%	1140	89.48%
46 – 55 (mid)	1959	4.23	0.79	99	5.05%	98	5.00%	1762	89.94%
56 – 65 (late)	1120	4.20	0.82	63	5.63%	69	6.16%	988	88.21%
Over 65 (late)	160	4.22	0.87	10	6.25%	10	6.25%	140	87.50%
<b>Education</b>									
GED/HS (Grp 1)	324	4.15	0.86	21	6.48%	25	7.72%	278	85.80%
Tech (Grp 1)	287	4.21	0.75	11	3.83%	18	6.27%	258	89.90%
Associate (Grp 2)	402	4.15	0.85	27	6.72%	21	5.22%	354	88.06%
Bachelor's (Grp 2)	2187	4.24	0.78	108	4.94%	98	4.48%	1981	90.58%
Master's (Grp 3)	1789	4.25	0.81	95	5.31%	100	5.59%	1594	89.10%
Doctorate (Grp 3)	198	4.25	0.88	14	7.07%	7	3.54%	177	89.39%

<b>10. I expect good things to happen.</b>									
EI-Q10-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.12	0.88	304	5.86%	681	13.13%	4202	81.01%
<b>Gender</b>									
Female	2021	4.15	0.87	107	5.29%	261	12.91%	1653	81.79%
Male	3166	4.10	0.89	197	6.22%	420	13.27%	2549	80.51%
<b>Org Level</b>									
Employee	1734	4.03	0.92	125	7.21%	273	15.74%	1336	77.05%
Mid Mgmt	2270	4.14	0.87	128	5.64%	284	12.51%	1858	81.85%
Sr Mgmt	872	4.28	0.82	35	4.01%	78	8.94%	759	87.04%
<b>Age</b>									
19 – 25 (early)	61	3.98	0.94	4	6.56%	12	19.67%	45	73.77%
26 – 35 (early)	612	4.18	0.87	30	4.90%	84	13.73%	498	81.37%
36 – 45 (mid)	1274	4.10	0.87	72	5.65%	179	14.05%	1023	80.30%
46 – 55 (mid)	1959	4.13	0.88	123	6.28%	235	12.00%	1601	81.73%
56 – 65 (late)	1120	4.11	0.89	69	6.16%	146	13.04%	905	80.80%
Over 65 (late)	160	4.16	0.87	6	3.75%	25	15.63%	129	80.63%
<b>Education</b>									
GED/HS (Grp 1)	324	3.99	0.91	24	7.41%	53	16.36%	247	76.23%
Tech (Grp 1)	287	4.08	0.81	12	4.18%	45	15.68%	230	80.14%
Associate (Grp 2)	402	3.99	0.97	39	9.70%	58	14.43%	305	75.87%
Bachelor's (Grp 2)	2187	4.09	0.88	132	6.04%	293	13.40%	1762	80.57%
Master's (Grp 3)	1789	4.20	0.87	92	5.14%	212	11.85%	1485	83.01%
Doctorate (Grp 3)	198	4.30	0.75	5	2.53%	20	10.10%	173	87.37%

<b>11. I like to share my emotions with others.</b>									
EI-Q11-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.00	1.09	1928	37.17%	1256	24.21%	2003	38.62%
<b>Gender</b>									
Female	2021	3.14	1.10	662	32.76%	451	22.32%	908	44.93%
Male	3166	2.91	1.08	1266	39.99%	805	25.43%	1095	34.59%
<b>Org Level</b>									
Employee	1734	2.97	1.10	659	38.00%	418	24.11%	657	37.89%
Mid Mgmt	2270	2.99	1.08	856	37.71%	547	24.10%	867	38.19%
Sr Mgmt	872	3.07	1.09	298	34.17%	212	24.31%	362	41.51%
<b>Age</b>									
19 – 25 (early)	61	2.87	1.19	29	47.54%	11	18.03%	21	34.43%
26 – 35 (early)	612	3.11	1.16	216	35.29%	123	20.10%	273	44.61%
36 – 45 (mid)	1274	3.04	1.11	458	35.95%	305	23.94%	511	40.11%
46 – 55 (mid)	1959	2.96	1.07	741	37.83%	494	25.22%	724	36.96%
56 – 65 (late)	1120	2.96	1.06	424	37.86%	282	25.18%	414	36.96%
Over 65 (late)	160	2.93	1.10	60	37.50%	40	25.00%	60	37.50%
<b>Education</b>									
GED/HS (Grp 1)	324	2.94	1.11	131	40.43%	75	23.15%	118	36.42%
Tech (Grp 1)	287	2.95	1.06	106	36.93%	80	27.87%	101	35.19%
Associate (Grp 2)	402	3.01	1.06	141	35.07%	98	24.38%	163	40.55%
Bachelor's (Grp 2)	2187	2.98	1.09	821	37.54%	543	24.83%	823	37.63%
Master's (Grp 3)	1789	3.03	1.12	665	37.17%	401	22.41%	723	40.41%
Doctorate (Grp 3)	198	3.04	1.06	64	32.32%	59	29.80%	75	37.88%

<b>12. When I experience a positive emotion, I know how to make it last.</b>									
EI-Q12-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.62	0.89	627	12.09%	1385	26.70%	3175	61.21%
<b>Gender</b>									
Female	2021	3.72	0.89	218	10.79%	448	22.17%	1355	67.05%
Male	3166	3.55	0.89	409	12.92%	937	29.60%	1820	57.49%
<b>Org Level</b>									
Employee	1734	3.56	0.93	254	14.65%	455	26.24%	1025	59.11%
Mid Mgmt	2270	3.62	0.88	261	11.50%	629	27.71%	1380	60.79%
Sr Mgmt	872	3.70	0.84	84	9.63%	214	24.54%	574	65.83%
<b>Age</b>									
19 – 25 (early)	61	3.66	1.08	12	19.67%	10	16.39%	39	63.93%
26 – 35 (early)	612	3.65	0.95	88	14.38%	134	21.90%	390	63.73%
36 – 45 (mid)	1274	3.61	0.89	148	11.62%	349	27.39%	777	60.99%
46 – 55 (mid)	1959	3.60	0.89	247	12.61%	511	26.08%	1201	61.31%
56 – 65 (late)	1120	3.61	0.87	119	10.63%	339	30.27%	662	59.11%
Over 65 (late)	160	3.69	0.77	13	8.13%	41	25.63%	106	66.25%
<b>Education</b>									
GED/HS (Grp 1)	324	3.67	0.89	37	11.42%	85	26.23%	202	62.35%
Tech (Grp 1)	287	3.66	0.82	24	8.36%	87	30.31%	176	61.32%
Associate (Grp 2)	402	3.68	0.91	47	11.69%	87	21.64%	268	66.67%
Bachelor's (Grp 2)	2187	3.58	0.87	265	12.12%	626	28.62%	1296	59.26%
Master's (Grp 3)	1789	3.62	0.92	237	13.25%	437	24.43%	1115	62.33%
Doctorate (Grp 3)	198	3.63	0.84	17	8.59%	63	31.82%	118	59.60%

<b>13. I arrange events others enjoy.</b>									
EI-Q13-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.67	1.00	659	12.70%	1237	23.85%	3291	63.45%
<b>Gender</b>									
Female	2021	3.93	0.94	164	8.11%	342	16.92%	1515	74.96%
Male	3166	3.51	1.00	495	15.63%	895	28.27%	1776	56.10%
<b>Org Level</b>									
Employee	1734	3.59	1.04	260	14.99%	447	25.78%	1027	59.23%
Mid Mgmt	2270	3.68	1.00	288	12.69%	515	22.69%	1467	64.63%
Sr Mgmt	872	3.81	0.91	75	8.60%	196	22.48%	601	68.92%
<b>Age</b>									
19 – 25 (early)	61	3.95	1.13	8	13.11%	7	11.48%	46	75.41%
26 – 35 (early)	612	3.74	1.00	74	12.09%	134	21.90%	404	66.01%
36 – 45 (mid)	1274	3.67	1.00	169	13.27%	301	23.63%	804	63.11%
46 – 55 (mid)	1959	3.65	0.99	246	12.56%	474	24.20%	1239	63.25%
56 – 65 (late)	1120	3.66	0.99	142	12.68%	282	25.18%	696	62.14%
Over 65 (late)	160	3.69	1.03	20	12.50%	39	24.38%	101	63.13%
<b>Education</b>									
GED/HS (Grp 1)	324	3.67	0.99	42	12.96%	86	26.54%	196	60.49%
Tech (Grp 1)	287	3.64	0.97	35	12.20%	80	27.87%	172	59.93%
Associate (Grp 2)	402	3.62	0.98	50	12.44%	106	26.37%	246	61.19%
Bachelor's (Grp 2)	2187	3.63	1.02	307	14.04%	524	23.96%	1356	62.00%
Master's (Grp 3)	1789	3.74	0.99	205	11.46%	394	22.02%	1190	66.52%
Doctorate (Grp 3)	198	3.73	0.96	20	10.10%	47	23.74%	131	66.16%



<b>14. I seek out activities that make me happy.</b>									
EI-Q14-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.26	0.75	150	2.89%	429	8.27%	4608	88.84%
<b>Gender</b>									
Female	2021	4.34	0.75	60	2.97%	113	5.59%	1848	91.44%
Male	3166	4.20	0.74	90	2.84%	316	9.98%	2760	87.18%
<b>Org Level</b>									
Employee	1734	4.26	0.74	54	3.11%	132	7.61%	1548	89.27%
Mid Mgmt	2270	4.25	0.75	64	2.82%	191	8.41%	2015	88.77%
Sr Mgmt	872	4.25	0.74	24	2.75%	73	8.37%	775	88.88%
<b>Age</b>									
19 – 25 (early)	61	4.39	0.74	2	3.28%	3	4.92%	56	91.80%
26 – 35 (early)	612	4.33	0.73	17	2.78%	36	5.88%	559	91.34%
36 – 45 (mid)	1274	4.28	0.73	35	2.75%	86	6.75%	1153	90.50%
46 – 55 (mid)	1959	4.23	0.75	59	3.01%	189	9.65%	1711	87.34%
56 – 65 (late)	1120	4.23	0.76	33	2.95%	96	8.57%	991	88.48%
Over 65 (late)	160	4.27	0.81	4	2.50%	18	11.25%	138	86.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.23	0.75	9	2.78%	33	10.19%	282	87.04%
Tech (Grp 1)	287	4.26	0.69	4	1.39%	25	8.71%	258	89.90%
Associate (Grp 2)	402	4.22	0.78	12	2.99%	38	9.45%	352	87.56%
Bachelor's (Grp 2)	2187	4.24	0.74	62	2.83%	186	8.50%	1939	88.66%
Master's (Grp 3)	1789	4.28	0.77	59	3.30%	132	7.38%	1598	89.32%
Doctorate (Grp 3)	198	4.33	0.70	4	2.02%	15	7.58%	179	90.40%

<b>15. I am aware of the non-verbal messages I send to others.</b>									
EI-Q15-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.57	0.99	969	18.68%	960	18.51%	3258	62.81%
<b>Gender</b>									
Female	2021	3.68	0.98	332	16.43%	301	14.89%	1388	68.68%
Male	3166	3.50	0.98	637	20.12%	659	20.81%	1870	59.07%
<b>Org Level</b>									
Employee	1734	3.48	0.99	355	20.47%	380	21.91%	999	57.61%
Mid Mgmt	2270	3.59	0.99	419	18.46%	376	16.56%	1475	64.98%
Sr Mgmt	872	3.68	0.97	141	16.17%	142	16.28%	589	67.55%
<b>Age</b>									
19 – 25 (early)	61	3.64	1.03	11	18.03%	11	18.03%	39	63.93%
26 – 35 (early)	612	3.67	1.03	107	17.48%	98	16.01%	407	66.50%
36 – 45 (mid)	1274	3.59	0.99	233	18.29%	231	18.13%	810	63.58%
46 – 55 (mid)	1959	3.56	0.97	358	18.27%	361	18.43%	1240	63.30%
56 – 65 (late)	1120	3.50	0.98	228	20.36%	225	20.09%	667	59.55%
Over 65 (late)	160	3.51	1.01	31	19.38%	34	21.25%	95	59.38%
<b>Education</b>									
GED/HS (Grp 1)	324	3.58	0.95	52	16.05%	73	22.53%	199	61.42%
Tech (Grp 1)	287	3.60	1.00	44	15.33%	66	23.00%	177	61.67%
Associate (Grp 2)	402	3.60	0.98	69	17.16%	78	19.40%	255	63.43%
Bachelor's (Grp 2)	2187	3.54	0.97	420	19.20%	422	19.30%	1345	61.50%
Master's (Grp 3)	1789	3.57	1.00	350	19.56%	294	16.43%	1145	64.00%
Doctorate (Grp 3)	198	3.71	1.01	34	17.17%	27	13.64%	137	69.19%

<b>16. I present myself in a way that makes a good impression on others.</b>									
EI-Q16-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.11	0.75	173	3.34%	636	12.26%	4378	84.40%
<b>Gender</b>									
Female	2021	4.16	0.74	61	3.02%	219	10.84%	1741	86.15%
Male	3166	4.09	0.75	112	3.54%	417	13.17%	2637	83.29%
<b>Org Level</b>									
Employee	1734	4.06	0.77	75	4.33%	236	13.61%	1423	82.06%
Mid Mgmt	2270	4.12	0.74	67	2.95%	276	12.16%	1927	84.89%
Sr Mgmt	872	4.21	0.72	22	2.52%	84	9.63%	766	87.84%
<b>Age</b>									
19 – 25 (early)	61	4.18	0.87	2	3.28%	12	19.67%	47	77.05%
26 – 35 (early)	612	4.27	0.71	15	2.45%	44	7.19%	553	90.36%
36 – 45 (mid)	1274	4.12	0.74	42	3.30%	154	12.09%	1078	84.62%
46 – 55 (mid)	1959	4.09	0.74	64	3.27%	255	13.02%	1640	83.72%
56 – 65 (late)	1120	4.06	0.76	41	3.66%	154	13.75%	925	82.59%
Over 65 (late)	160	4.08	0.84	9	5.63%	17	10.63%	134	83.75%
<b>Education</b>									
GED/HS (Grp 1)	324	4.10	0.75	9	2.78%	48	14.81%	267	82.41%
Tech (Grp 1)	287	4.16	0.69	7	2.44%	29	10.10%	251	87.46%
Associate (Grp 2)	402	4.13	0.76	15	3.73%	43	10.70%	344	85.57%
Bachelor's (Grp 2)	2187	4.08	0.73	63	2.88%	295	13.49%	1829	83.63%
Master's (Grp 3)	1789	4.15	0.77	72	4.02%	188	10.51%	1529	85.47%
Doctorate (Grp 3)	198	4.08	0.79	7	3.54%	33	16.67%	158	79.80%

<b>17. When I am in a positive mood, solving problems is easy for me.</b>									
EI-Q17-UOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.25	0.78	88	1.70%	752	14.50%	4347	83.81%
<b>Gender</b>									
Female	2021	4.29	0.78	31	1.53%	281	13.90%	1709	84.56%
Male	3166	4.22	0.78	57	1.80%	471	14.88%	2638	83.32%
<b>Org Level</b>									
Employee	1734	4.24	0.77	31	1.79%	247	14.24%	1456	83.97%
Mid Mgmt	2270	4.25	0.79	40	1.76%	321	14.14%	1909	84.10%
Sr Mgmt	872	4.31	0.78	14	1.61%	124	14.22%	734	84.17%
<b>Age</b>									
19 – 25 (early)	61	4.23	0.88	3	4.92%	6	9.84%	52	85.25%
26 – 35 (early)	612	4.34	0.77	8	1.31%	78	12.75%	526	85.95%
36 – 45 (mid)	1274	4.29	0.75	19	1.49%	157	12.32%	1098	86.19%
46 – 55 (mid)	1959	4.24	0.78	32	1.63%	297	15.16%	1630	83.21%
56 – 65 (late)	1120	4.19	0.80	23	2.05%	187	16.70%	910	81.25%
Over 65 (late)	160	4.17	0.82	3	1.88%	27	16.88%	130	81.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.22	0.79	6	1.85%	46	14.20%	272	83.95%
Tech (Grp 1)	287	4.21	0.72	2	0.70%	41	14.29%	244	85.02%
Associate (Grp 2)	402	4.26	0.83	14	3.48%	47	11.69%	341	84.83%
Bachelor's (Grp 2)	2187	4.22	0.77	35	1.60%	334	15.27%	1818	83.13%
Master's (Grp 3)	1789	4.29	0.79	26	1.45%	253	14.14%	1510	84.40%
Doctorate (Grp 3)	198	4.27	0.82	5	2.53%	31	15.66%	162	81.82%

<b>18. By looking at their facial expressions, I recognize the emotions people are experiencing.</b>									
EI-Q18-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.05	0.72	242	4.67%	417	8.04%	4528	87.30%
<b>Gender</b>									
Female	2021	4.16	0.69	65	3.22%	115	5.69%	1841	91.09%
Male	3166	3.99	0.73	177	5.59%	302	9.54%	2687	84.87%
<b>Org Level</b>									
Employee	1734	4.01	0.76	105	6.06%	139	8.02%	1490	85.93%
Mid Mgmt	2270	4.06	0.70	92	4.05%	177	7.80%	2001	88.15%
Sr Mgmt	872	4.13	0.68	31	3.56%	61	7.00%	780	89.45%
<b>Age</b>									
19 – 25 (early)	61	4.13	0.90	6	9.84%	3	4.92%	52	85.25%
26 – 35 (early)	612	4.15	0.74	28	4.58%	33	5.39%	551	90.03%
36 – 45 (mid)	1274	4.08	0.72	56	4.40%	84	6.59%	1134	89.01%
46 – 55 (mid)	1959	4.05	0.68	74	3.78%	174	8.88%	1711	87.34%
56 – 65 (late)	1120	3.98	0.75	68	6.07%	109	9.73%	943	84.20%
Over 65 (late)	160	3.96	0.73	10	6.25%	13	8.13%	137	85.63%
<b>Education</b>									
GED/HS (Grp 1)	324	4.07	0.66	9	2.78%	32	9.88%	283	87.35%
Tech (Grp 1)	287	4.05	0.64	9	3.14%	21	7.32%	257	89.55%
Associate (Grp 2)	402	4.05	0.72	19	4.73%	27	6.72%	356	88.56%
Bachelor's (Grp 2)	2187	4.05	0.70	95	4.34%	172	7.86%	1920	87.79%
Master's (Grp 3)	1789	4.05	0.76	95	5.31%	158	8.83%	1536	85.86%
Doctorate (Grp 3)	198	4.14	0.80	15	7.58%	7	3.54%	176	88.89%

<b>19. I know why my emotions change.</b>									
EI-Q19-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.01	0.85	377	7.27%	583	11.24%	4227	81.49%
<b>Gender</b>									
Female	2021	4.10	0.82	123	6.09%	174	8.61%	1724	85.30%
Male	3166	3.95	0.86	254	8.02%	409	12.92%	2503	79.06%
<b>Org Level</b>									
Employee	1734	3.99	0.86	141	8.13%	184	10.61%	1409	81.26%
Mid Mgmt	2270	4.00	0.85	163	7.18%	275	12.11%	1832	80.70%
Sr Mgmt	872	4.09	0.79	47	5.39%	81	9.29%	744	85.32%
<b>Age</b>									
19 – 25 (early)	61	3.93	1.08	9	14.75%	7	11.48%	45	73.77%
26 – 35 (early)	612	4.02	0.89	49	8.01%	65	10.62%	498	81.37%
36 – 45 (mid)	1274	4.05	0.83	83	6.51%	129	10.13%	1062	83.36%
46 – 55 (mid)	1959	4.01	0.83	136	6.94%	210	10.72%	1613	82.34%
56 – 65 (late)	1120	3.96	0.85	88	7.86%	138	12.32%	894	79.82%
Over 65 (late)	160	3.93	0.93	12	7.50%	33	20.63%	115	71.88%
<b>Education</b>									
GED/HS (Grp 1)	324	4.00	0.82	22	6.79%	39	12.04%	263	81.17%
Tech (Grp 1)	287	3.93	0.85	20	6.97%	48	16.72%	219	76.31%
Associate (Grp 2)	402	3.96	0.94	39	9.70%	49	12.19%	314	78.11%
Bachelor's (Grp 2)	2187	4.01	0.82	141	6.45%	254	11.61%	1792	81.94%
Master's (Grp 3)	1789	4.03	0.87	141	7.88%	175	9.78%	1473	82.34%
Doctorate (Grp 3)	198	4.05	0.85	14	7.07%	18	9.09%	166	83.84%

<b>20. When I am in a positive mood, I am able to come up with new ideas.</b>									
EI-Q20-UOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.18	0.75	75	1.45%	817	15.75%	4295	82.80%
<b>Gender</b>									
Female	2021	4.21	0.75	27	1.34%	299	14.79%	1695	83.87%
Male	3166	4.16	0.75	48	1.52%	518	16.36%	2600	82.12%
<b>Org Level</b>									
Employee	1734	4.18	0.73	25	1.44%	257	14.82%	1452	83.74%
Mid Mgmt	2270	4.17	0.76	35	1.54%	361	15.90%	1874	82.56%
Sr Mgmt	872	4.25	0.74	7	0.80%	132	15.14%	733	84.06%
<b>Age</b>									
19 – 25 (early)	61	4.07	0.83	2	3.28%	10	16.39%	49	80.33%
26 – 35 (early)	612	4.22	0.72	5	0.82%	87	14.22%	520	84.97%
36 – 45 (mid)	1274	4.21	0.75	19	1.49%	183	14.36%	1072	84.14%
46 – 55 (mid)	1959	4.16	0.74	31	1.58%	309	15.77%	1619	82.64%
56 – 65 (late)	1120	4.15	0.78	16	1.43%	204	18.21%	900	80.36%
Over 65 (late)	160	4.25	0.77	2	1.25%	23	14.38%	135	84.38%
<b>Education</b>									
GED/HS (Grp 1)	324	4.17	0.76	6	1.85%	43	13.27%	275	84.88%
Tech (Grp 1)	287	4.12	0.76	6	2.09%	47	16.38%	234	81.53%
Associate (Grp 2)	402	4.12	0.78	11	2.74%	59	14.68%	332	82.59%
Bachelor's (Grp 2)	2187	4.16	0.73	22	1.01%	361	16.51%	1804	82.49%
Master's (Grp 3)	1789	4.22	0.76	27	1.51%	276	15.43%	1486	83.06%
Doctorate (Grp 3)	198	4.22	0.76	3	1.52%	31	15.66%	164	82.83%

<b>21. I have control over my emotions.</b>									
EI-Q21-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.82	0.92	604	11.64%	749	14.44%	3834	73.92%
<b>Gender</b>									
Female	2021	3.77	0.96	279	13.81%	256	12.67%	1486	73.53%
Male	3166	3.85	0.89	325	10.27%	493	15.57%	2348	74.16%
<b>Org Level</b>									
Employee	1734	3.73	0.96	258	14.88%	255	14.71%	1221	70.42%
Mid Mgmt	2270	3.83	0.91	250	11.01%	339	14.93%	1681	74.05%
Sr Mgmt	872	3.96	0.84	69	7.91%	105	12.04%	698	80.05%
<b>Age</b>									
19 – 25 (early)	61	3.82	1.01	10	16.39%	7	11.48%	44	72.13%
26 – 35 (early)	612	3.83	0.98	82	13.40%	79	12.91%	451	73.69%
36 – 45 (mid)	1274	3.86	0.92	144	11.30%	166	13.03%	964	75.67%
46 – 55 (mid)	1959	3.79	0.91	223	11.38%	312	15.93%	1424	72.69%
56 – 65 (late)	1120	3.81	0.88	121	10.80%	166	14.82%	833	74.38%
Over 65 (late)	160	3.81	0.97	24	15.00%	18	11.25%	118	73.75%
<b>Education</b>									
GED/HS (Grp 1)	324	3.80	0.94	36	11.11%	58	17.90%	230	70.99%
Tech (Grp 1)	287	3.76	0.86	29	10.10%	56	19.51%	202	70.38%
Associate (Grp 2)	402	3.81	0.92	49	12.19%	58	14.43%	295	73.38%
Bachelor's (Grp 2)	2187	3.80	0.91	271	12.39%	304	13.90%	1612	73.71%
Master's (Grp 3)	1789	3.86	0.93	196	10.96%	244	13.64%	1349	75.41%
Doctorate (Grp 3)	198	3.82	0.93	23	11.62%	29	14.65%	146	73.74%

<b>22. I easily recognize my emotions as I experience them.</b>									
EI-Q22-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.06	0.81	304	5.86%	575	11.09%	4308	83.05%
<b>Gender</b>									
Female	2021	4.13	0.81	117	5.79%	169	8.36%	1735	85.85%
Male	3166	4.02	0.80	187	5.91%	406	12.82%	2573	81.27%
<b>Org Level</b>									
Employee	1734	4.03	0.83	118	6.81%	198	11.42%	1418	81.78%
Mid Mgmt	2270	4.04	0.81	135	5.95%	247	10.88%	1888	83.17%
Sr Mgmt	872	4.15	0.75	35	4.01%	84	9.63%	753	86.35%
<b>Age</b>									
19 – 25 (early)	61	3.93	0.89	4	6.56%	11	18.03%	46	75.41%
26 – 35 (early)	612	4.11	0.81	32	5.23%	64	10.46%	516	84.31%
36 – 45 (mid)	1274	4.09	0.80	71	5.57%	126	9.89%	1077	84.54%
46 – 55 (mid)	1959	4.05	0.79	112	5.72%	225	11.49%	1622	82.80%
56 – 65 (late)	1120	4.03	0.83	72	6.43%	131	11.70%	917	81.88%
Over 65 (late)	160	4.04	0.88	13	8.13%	17	10.63%	130	81.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.06	0.81	18	5.56%	40	12.35%	266	82.10%
Tech (Grp 1)	287	3.97	0.84	19	6.62%	43	14.98%	225	78.40%
Associate (Grp 2)	402	4.01	0.91	33	8.21%	43	10.70%	326	81.09%
Bachelor's (Grp 2)	2187	4.06	0.77	111	5.08%	241	11.02%	1835	83.90%
Master's (Grp 3)	1789	4.08	0.82	109	6.09%	189	10.56%	1491	83.34%
Doctorate (Grp 3)	198	4.11	0.85	14	7.07%	19	9.60%	165	83.33%

<b>23. I motivate myself by imagining a good outcome to tasks I take on.</b>									
EI-Q23-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.97	0.92	414	7.98%	871	16.79%	3902	75.23%
<b>Gender</b>									
Female	2021	4.04	0.91	139	6.88%	305	15.09%	1577	78.03%
Male	3166	3.93	0.93	275	8.69%	566	17.88%	2325	73.44%
<b>Org Level</b>									
Employee	1734	3.94	0.93	147	8.48%	292	16.84%	1295	74.68%
Mid Mgmt	2270	3.95	0.94	205	9.03%	388	17.09%	1677	73.88%
Sr Mgmt	872	4.08	0.88	46	5.28%	141	16.17%	685	78.56%
<b>Age</b>									
19 – 25 (early)	61	3.98	1.19	8	13.11%	7	11.48%	46	75.41%
26 – 35 (early)	612	3.92	1.00	68	11.11%	103	16.83%	441	72.06%
36 – 45 (mid)	1274	3.92	0.96	118	9.26%	223	17.50%	933	73.23%
46 – 55 (mid)	1959	4.00	0.90	139	7.10%	322	16.44%	1498	76.47%
56 – 65 (late)	1120	4.01	0.88	69	6.16%	194	17.32%	857	76.52%
Over 65 (late)	160	4.04	0.90	11	6.88%	22	13.75%	127	79.38%
<b>Education</b>									
GED/HS (Grp 1)	324	3.93	0.95	30	9.26%	59	18.21%	235	72.53%
Tech (Grp 1)	287	4.07	0.86	17	5.92%	39	13.59%	231	80.49%
Associate (Grp 2)	402	4.01	0.87	25	6.22%	64	15.92%	313	77.86%
Bachelor's (Grp 2)	2187	3.93	0.92	177	8.09%	402	18.38%	1608	73.53%
Master's (Grp 3)	1789	4.00	0.94	152	8.50%	273	15.26%	1364	76.24%
Doctorate (Grp 3)	198	4.08	0.92	13	6.57%	34	17.17%	151	76.26%

<b>24. I compliment others when they have done something well.</b>									
EI-Q24-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.63	0.61	70	1.35%	103	1.99%	5014	96.66%
<b>Gender</b>									
Female	2021	4.71	0.55	19	0.94%	24	1.19%	1978	97.87%
Male	3166	4.58	0.64	51	1.61%	79	2.50%	3036	95.89%
<b>Org Level</b>									
Employee	1734	4.60	0.62	25	1.44%	37	2.13%	1672	96.42%
Mid Mgmt	2270	4.63	0.62	33	1.45%	45	1.98%	2192	96.56%
Sr Mgmt	872	4.67	0.57	10	1.15%	14	1.61%	848	97.25%
<b>Age</b>									
19 – 25 (early)	61	4.44	0.89	3	4.92%	4	6.56%	54	88.52%
26 – 35 (early)	612	4.60	0.63	9	1.47%	13	2.12%	590	96.41%
36 – 45 (mid)	1274	4.61	0.60	12	0.94%	35	2.75%	1227	96.31%
46 – 55 (mid)	1959	4.63	0.60	29	1.48%	30	1.53%	1900	96.99%
56 – 65 (late)	1120	4.67	0.58	13	1.16%	17	1.52%	1090	97.32%
Over 65 (late)	160	4.69	0.70	4	2.50%	4	2.50%	152	95.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.65	0.56	2	0.62%	8	2.47%	314	96.91%
Tech (Grp 1)	287	4.63	0.57	3	1.05%	4	1.39%	280	97.56%
Associate (Grp 2)	402	4.68	0.65	9	2.24%	3	0.75%	390	97.01%
Bachelor's (Grp 2)	2187	4.62	0.60	25	1.14%	51	2.33%	2111	96.52%
Master's (Grp 3)	1789	4.62	0.62	28	1.57%	32	1.79%	1729	96.65%
Doctorate (Grp 3)	198	4.70	0.59	3	1.52%	5	2.53%	190	95.96%

<b>25. I am aware of the non-verbal messages other people send.</b>									
EI-Q25-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.96	0.84	428	8.25%	587	11.32%	4172	80.43%
<b>Gender</b>									
Female	2021	4.13	0.79	116	5.74%	144	7.13%	1761	87.14%
Male	3166	3.86	0.86	312	9.85%	443	13.99%	2411	76.15%
<b>Org Level</b>									
Employee	1734	3.86	0.88	188	10.84%	225	12.98%	1321	76.18%
Mid Mgmt	2270	4.00	0.82	164	7.22%	240	10.57%	1866	82.20%
Sr Mgmt	872	4.11	0.80	48	5.50%	84	9.63%	740	84.86%
<b>Age</b>									
19 – 25 (early)	61	3.87	0.94	6	9.84%	10	16.39%	45	73.77%
26 – 35 (early)	612	4.09	0.81	39	6.37%	54	8.82%	519	84.80%
36 – 45 (mid)	1274	3.99	0.83	96	7.54%	137	10.75%	1041	81.71%
46 – 55 (mid)	1959	3.95	0.84	162	8.27%	222	11.33%	1575	80.40%
56 – 65 (late)	1120	3.92	0.86	104	9.29%	139	12.41%	877	78.30%
Over 65 (late)	160	3.79	0.96	21	13.13%	24	15.00%	115	71.88%
<b>Education</b>									
GED/HS (Grp 1)	324	3.96	0.81	21	6.48%	49	15.12%	254	78.40%
Tech (Grp 1)	287	3.91	0.82	21	7.32%	44	15.33%	222	77.35%
Associate (Grp 2)	402	3.91	0.84	35	8.71%	50	12.44%	317	78.86%
Bachelor's (Grp 2)	2187	3.97	0.83	176	8.05%	242	11.07%	1769	80.89%
Master's (Grp 3)	1789	3.98	0.87	157	8.78%	183	10.23%	1449	80.99%
Doctorate (Grp 3)	198	3.99	0.87	18	9.09%	19	9.60%	161	81.31%

**26. When another person tells me about an important event in his or her life, I almost feel as though I experienced this event myself.**

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.31	0.96	1014	19.55%	1748	33.70%	2425	46.75%
<b>Gender</b>									
Female	2021	3.42	0.95	334	16.53%	642	31.77%	1045	51.71%
Male	3166	3.24	0.96	680	21.48%	1106	34.93%	1380	43.59%
<b>Org Level</b>									
Employee	1734	3.28	0.97	352	20.30%	590	34.03%	792	45.67%
Mid Mgmt	2270	3.31	0.95	444	19.56%	768	33.83%	1058	46.61%
Sr Mgmt	872	3.34	0.95	159	18.23%	285	32.68%	428	49.08%
<b>Age</b>									
19 – 25 (early)	61	3.15	1.03	17	27.87%	20	32.79%	24	39.34%
26 – 35 (early)	612	3.31	1.01	129	21.08%	187	30.56%	296	48.37%
36 – 45 (mid)	1274	3.30	1.00	272	21.35%	403	31.63%	599	47.02%
46 – 55 (mid)	1959	3.33	0.94	367	18.73%	647	33.03%	945	48.24%
56 – 65 (late)	1120	3.28	0.92	204	18.21%	425	37.95%	491	43.84%
Over 65 (late)	160	3.34	0.85	25	15.63%	65	40.63%	70	43.75%
<b>Education</b>									
GED/HS (Grp 1)	324	3.29	0.94	64	19.75%	118	36.42%	142	43.83%
Tech (Grp 1)	287	3.30	0.87	47	16.38%	112	39.02%	128	44.60%
Associate (Grp 2)	402	3.30	0.90	68	16.92%	156	38.81%	178	44.28%
Bachelor's (Grp 2)	2187	3.29	0.95	439	20.07%	744	34.02%	1004	45.91%
Master's (Grp 3)	1789	3.34	1.00	361	20.18%	555	31.02%	873	48.80%
Doctorate (Grp 3)	198	3.36	0.98	35	17.68%	63	31.82%	100	50.51%

**27. When I feel a change in emotions, I tend to come up with new ideas.**

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.35	0.78	548	10.56%	2583	49.80%	2056	39.64%
<b>Gender</b>									
Female	2021	3.40	0.78	193	9.55%	957	47.35%	871	43.10%
Male	3166	3.31	0.78	355	11.21%	1626	51.36%	1185	37.43%
<b>Org Level</b>									
Employee	1734	3.34	0.79	192	11.07%	856	49.37%	686	39.56%
Mid Mgmt	2270	3.33	0.78	254	11.19%	1125	49.56%	891	39.25%
Sr Mgmt	872	3.39	0.75	77	8.83%	434	49.77%	361	41.40%
<b>Age</b>									
19 – 25 (early)	61	3.25	0.99	14	22.95%	19	31.15%	28	45.90%
26 – 35 (early)	612	3.42	0.80	60	9.80%	280	45.75%	272	44.44%
36 – 45 (mid)	1274	3.41	0.78	111	8.71%	619	48.59%	544	42.70%
46 – 55 (mid)	1959	3.32	0.78	222	11.33%	993	50.69%	744	37.98%
56 – 65 (late)	1120	3.30	0.76	125	11.16%	589	52.59%	406	36.25%
Over 65 (late)	160	3.34	0.76	16	10.00%	82	51.25%	62	38.75%
<b>Education</b>									
GED/HS (Grp 1)	324	3.41	0.83	38	11.73%	145	44.75%	141	43.52%
Tech (Grp 1)	287	3.35	0.76	24	8.36%	155	54.01%	108	37.63%
Associate (Grp 2)	402	3.38	0.78	37	9.20%	200	49.75%	165	41.04%
Bachelor's (Grp 2)	2187	3.30	0.75	244	11.16%	1131	51.71%	812	37.13%
Master's (Grp 3)	1789	3.38	0.80	187	10.45%	851	47.57%	751	41.98%
Doctorate (Grp 3)	198	3.38	0.82	18	9.09%	101	51.01%	79	39.90%

<b>28. When I am faced with a challenge, I give up because I believe I will fail.</b>									
EI-Q28-MSE(R)									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.66	0.69	4900	94.47%	170	3.28%	117	2.26%
<b>Gender</b>									
Female	2021	4.66	0.68	1913	94.66%	63	3.12%	45	2.23%
Male	3166	4.65	0.69	2987	94.35%	107	3.38%	72	2.27%
<b>Org Level</b>									
Employee	1734	4.56	0.76	1599	92.21%	83	4.79%	52	3.00%
Mid Mgmt	2270	4.68	0.66	2162	95.24%	62	2.73%	46	2.03%
Sr Mgmt	872	4.78	0.61	846	97.02%	10	1.15%	16	1.83%
<b>Age</b>									
19 – 25 (early)	61	4.57	0.72	57	93.44%	2	3.28%	2	3.28%
26 – 35 (early)	612	4.62	0.71	583	95.26%	11	1.80%	18	2.94%
36 – 45 (mid)	1274	4.62	0.73	1189	93.33%	50	3.92%	35	2.75%
46 – 55 (mid)	1959	4.67	0.68	1852	94.54%	65	3.32%	42	2.14%
56 – 65 (late)	1120	4.69	0.63	1065	95.09%	38	3.39%	17	1.52%
Over 65 (late)	160	4.73	0.66	153	95.63%	4	2.50%	3	1.88%
<b>Education</b>									
GED/HS (Grp 1)	324	4.60	0.75	298	91.98%	18	5.56%	8	2.47%
Tech (Grp 1)	287	4.66	0.60	274	95.47%	10	3.48%	3	1.05%
Associate (Grp 2)	402	4.68	0.62	385	95.77%	12	2.99%	5	1.24%
Bachelor's (Grp 2)	2187	4.65	0.69	2066	94.47%	71	3.25%	50	2.29%
Master's (Grp 3)	1789	4.66	0.71	1690	94.47%	50	2.79%	49	2.74%
Doctorate (Grp 3)	198	4.68	0.61	187	94.44%	9	4.55%	2	1.01%

<b>29. I know what other people are feeling just by looking at them.</b>									
EI-Q29-POE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.33	0.94	1053	20.30%	1434	27.65%	2700	52.05%
<b>Gender</b>									
Female	2021	3.46	0.91	331	16.38%	501	24.79%	1189	58.83%
Male	3166	3.25	0.95	722	22.80%	933	29.47%	1511	47.73%
<b>Org Level</b>									
Employee	1734	3.28	0.95	377	21.74%	502	28.95%	855	49.31%
Mid Mgmt	2270	3.36	0.92	440	19.38%	613	27.00%	1217	53.61%
Sr Mgmt	872	3.34	0.94	177	20.30%	231	26.49%	464	53.21%
<b>Age</b>									
19 – 25 (early)	61	3.48	0.98	11	18.03%	17	27.87%	33	54.10%
26 – 35 (early)	612	3.43	0.93	108	17.65%	159	25.98%	345	56.37%
36 – 45 (mid)	1274	3.44	0.90	208	16.33%	334	26.22%	732	57.46%
46 – 55 (mid)	1959	3.30	0.93	412	21.03%	556	28.38%	991	50.59%
56 – 65 (late)	1120	3.20	0.97	277	24.73%	321	28.66%	522	46.61%
Over 65 (late)	160	3.22	0.96	37	23.13%	46	28.75%	77	48.13%
<b>Education</b>									
GED/HS (Grp 1)	324	3.29	0.95	64	19.75%	105	32.41%	155	47.84%
Tech (Grp 1)	287	3.31	0.90	53	18.47%	95	33.10%	139	48.43%
Associate (Grp 2)	402	3.30	0.94	84	20.90%	124	30.85%	194	48.26%
Bachelor's (Grp 2)	2187	3.35	0.91	420	19.20%	603	27.57%	1164	53.22%
Master's (Grp 3)	1789	3.32	0.97	389	21.74%	462	25.82%	938	52.43%
Doctorate (Grp 3)	198	3.37	0.96	43	21.72%	45	22.73%	110	55.56%



<b>30. I help other people feel better when they are down.</b>									
EI-Q30-MOE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.03	0.73	178	3.43%	685	13.21%	4324	83.36%
<b>Gender</b>									
Female	2021	4.12	0.71	56	2.77%	201	9.95%	1764	87.28%
Male	3166	3.97	0.74	122	3.85%	484	15.29%	2560	80.86%
<b>Org Level</b>									
Employee	1734	4.02	0.74	64	3.69%	239	13.78%	1431	82.53%
Mid Mgmt	2270	4.01	0.73	83	3.66%	289	12.73%	1898	83.61%
Sr Mgmt	872	4.06	0.68	21	2.41%	113	12.96%	738	84.63%
<b>Age</b>									
19 – 25 (early)	61	4.10	0.79	4	6.56%	4	6.56%	53	86.89%
26 – 35 (early)	612	4.05	0.77	24	3.92%	86	14.05%	502	82.03%
36 – 45 (mid)	1274	4.04	0.73	41	3.22%	171	13.42%	1062	83.36%
46 – 55 (mid)	1959	4.01	0.71	63	3.22%	267	13.63%	1629	83.15%
56 – 65 (late)	1120	4.01	0.72	41	3.66%	139	12.41%	940	83.93%
Over 65 (late)	160	4.10	0.76	5	3.13%	18	11.25%	137	85.63%
<b>Education</b>									
GED/HS (Grp 1)	324	4.06	0.66	5	1.54%	46	14.20%	273	84.26%
Tech (Grp 1)	287	4.05	0.74	11	3.83%	33	11.50%	243	84.67%
Associate (Grp 2)	402	4.03	0.77	15	3.73%	46	11.44%	341	84.83%
Bachelor's (Grp 2)	2187	4.00	0.73	80	3.66%	303	13.85%	1804	82.49%
Master's (Grp 3)	1789	4.04	0.73	60	3.35%	234	13.08%	1495	83.57%
Doctorate (Grp 3)	198	4.08	0.72	7	3.54%	23	11.62%	168	84.85%

<b>31. I use good moods to help myself keep trying in the face of obstacles.</b>									
EI-Q31-MSE									
	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.89	0.84	306	5.90%	1084	20.90%	3797	73.20%
<b>Gender</b>									
Female	2021	4.01	0.80	85	4.21%	358	17.71%	1578	78.08%
Male	3166	3.82	0.85	221	6.98%	726	22.93%	2219	70.09%
<b>Org Level</b>									
Employee	1734	3.87	0.85	111	6.40%	369	21.28%	1254	72.32%
Mid Mgmt	2270	3.90	0.84	137	6.04%	460	20.26%	1673	73.70%
Sr Mgmt	872	3.92	0.84	45	5.16%	180	20.64%	647	74.20%
<b>Age</b>									
19 – 25 (early)	61	3.93	0.89	4	6.56%	11	18.03%	46	75.41%
26 – 35 (early)	612	3.99	0.82	30	4.90%	104	16.99%	478	78.10%
36 – 45 (mid)	1274	3.93	0.83	79	6.20%	217	17.03%	978	76.77%
46 – 55 (mid)	1959	3.87	0.83	114	5.82%	438	22.36%	1407	71.82%
56 – 65 (late)	1120	3.84	0.88	74	6.61%	271	24.20%	775	69.20%
Over 65 (late)	160	3.89	0.82	5	3.13%	42	26.25%	113	70.63%
<b>Education</b>									
GED/HS (Grp 1)	324	3.90	0.81	15	4.63%	74	22.84%	235	72.53%
Tech (Grp 1)	287	3.95	0.76	9	3.14%	64	22.30%	214	74.56%
Associate (Grp 2)	402	3.92	0.82	21	5.22%	75	18.66%	306	76.12%
Bachelor's (Grp 2)	2187	3.87	0.84	138	6.31%	451	20.62%	1598	73.07%
Master's (Grp 3)	1789	3.91	0.86	110	6.15%	372	20.79%	1307	73.06%
Doctorate (Grp 3)	198	3.87	0.89	13	6.57%	48	24.24%	137	69.19%

**32. I can tell how people are feeling by listening to the tone of their voice.**  
EI-Q32-POE

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.95	0.71	239	4.61%	619	11.93%	4329	83.46%
<b>Gender</b>									
Female	2021	4.04	0.69	77	3.81%	173	8.56%	1771	87.63%
Male	3166	3.90	0.73	162	5.12%	446	14.09%	2558	80.80%
<b>Org Level</b>									
Employee	1734	3.93	0.73	91	5.25%	199	11.48%	1444	83.28%
Mid Mgmt	2270	3.97	0.70	96	4.23%	272	11.98%	1902	83.79%
Sr Mgmt	872	3.99	0.71	37	4.24%	101	11.58%	734	84.17%
<b>Age</b>									
19 – 25 (early)	61	4.00	0.91	5	8.20%	7	11.48%	49	80.33%
26 – 35 (early)	612	4.04	0.67	19	3.10%	53	8.66%	540	88.24%
36 – 45 (mid)	1274	3.98	0.72	60	4.71%	131	10.28%	1083	85.01%
46 – 55 (mid)	1959	3.94	0.71	84	4.29%	251	12.81%	1624	82.90%
56 – 65 (late)	1120	3.92	0.72	58	5.18%	151	13.48%	911	81.34%
Over 65 (late)	160	3.83	0.80	13	8.13%	25	15.63%	122	76.25%
<b>Education</b>									
GED/HS (Grp 1)	324	3.92	0.72	17	5.25%	43	13.27%	264	81.48%
Tech (Grp 1)	287	3.98	0.63	6	2.09%	42	14.63%	239	83.28%
Associate (Grp 2)	402	3.90	0.73	18	4.48%	62	15.42%	322	80.10%
Bachelor's (Grp 2)	2187	3.99	0.68	83	3.80%	228	10.43%	1876	85.78%
Master's (Grp 3)	1789	3.93	0.76	102	5.70%	216	12.07%	1471	82.22%
Doctorate (Grp 3)	198	3.94	0.81	13	6.57%	28	14.14%	157	79.29%

**33. It is difficult for me to understand why people feel the way they do.**  
EI-Q33-POE(R)

	<i>n</i>	M	SD	Disagree or Strongly Disagree		Neither Disagree nor Agree		Agree or Strongly Agree	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.62	1.00	3206	61.81%	1134	21.86%	847	16.33%
<b>Gender</b>									
Female	2021	3.77	1.00	1381	68.33%	357	17.66%	283	14.00%
Male	3166	3.53	1.00	1825	57.64%	777	24.54%	564	17.81%
<b>Org Level</b>									
Employee	1734	3.55	1.03	1016	58.59%	390	22.49%	328	18.92%
Mid Mgmt	2270	3.63	0.99	1403	61.81%	509	22.42%	358	15.77%
Sr Mgmt	872	3.75	0.97	596	68.35%	163	18.69%	113	12.96%
<b>Age</b>									
19 – 25 (early)	61	3.49	1.18	36	59.02%	8	13.11%	17	27.87%
26 – 35 (early)	612	3.60	1.07	394	64.38%	101	16.50%	117	19.12%
36 – 45 (mid)	1274	3.63	1.01	784	61.54%	280	21.98%	210	16.48%
46 – 55 (mid)	1959	3.65	0.99	1221	62.33%	443	22.61%	295	15.06%
56 – 65 (late)	1120	3.60	0.98	676	60.36%	266	23.75%	178	15.89%
Over 65 (late)	160	3.57	1.02	94	58.75%	36	22.50%	30	18.75%
<b>Education</b>									
GED/HS (Grp 1)	324	3.47	1.04	180	55.56%	72	22.22%	72	22.22%
Tech (Grp 1)	287	3.54	1.00	168	58.54%	65	22.65%	54	18.82%
Associate (Grp 2)	402	3.66	1.01	247	61.44%	95	23.63%	60	14.93%
Bachelor's (Grp 2)	2187	3.61	0.99	1342	61.36%	494	22.59%	351	16.05%
Master's (Grp 3)	1789	3.66	1.01	1139	63.67%	368	20.57%	282	15.76%
Doctorate (Grp 3)	198	3.74	1.03	130	65.66%	40	20.20%	28	14.14%

## Appendix L

### Utrecht Work Engagement Scale Individual Question Response Data

Data in this appendix includes only demographic characteristics used in ANOVA analysis. Not included are participants who reported organizational level as “other” ( $n = 311$ ) and were age 18 and under ( $n = 1$ ). Question numbers are coded as WE - <question number> - <WE sub-element>. Sub-elements include vigor (VI), dedication (DE), and absorption (AB).

<b>1. At my work, I feel bursting with energy.</b>									
<b>WE-Q1-VI</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.24	1.16	352	6.79%	2215	42.70%	2620	50.51%
<b>Gender</b>									
Female	2021	4.26	1.16	133	6.58%	852	42.16%	1036	51.26%
Male	3166	4.23	1.16	219	6.92%	1363	43.05%	1584	50.03%
<b>Org Level</b>									
Employee	1734	4.04	1.24	173	9.98%	809	46.66%	752	43.37%
Mid Mgmt	2270	4.27	1.12	140	6.17%	968	42.64%	1162	51.19%
Sr Mgmt	872	4.52	1.02	22	2.52%	322	36.93%	528	60.55%
<b>Age</b>									
19 – 25 (early)	61	3.89	1.33	9	14.75%	27	44.26%	25	40.98%
26 – 35 (early)	612	4.11	1.22	55	8.99%	280	45.75%	277	45.26%
36 – 45 (mid)	1274	4.12	1.20	107	8.40%	577	45.29%	590	46.31%
46 – 55 (mid)	1959	4.29	1.13	119	6.07%	827	42.22%	1013	51.71%
56 – 65 (late)	1120	4.36	1.10	56	5.00%	444	39.64%	620	55.36%
Over 65 (late)	160	4.51	1.08	6	3.75%	59	36.88%	95	59.38%
<b>Education</b>									
GED/HS (Grp 1)	324	4.27	1.09	21	6.48%	135	41.67%	168	51.85%
Tech (Grp 1)	287	4.32	1.10	15	5.23%	113	39.37%	159	55.40%
Associate (Grp 2)	402	4.40	1.10	23	5.72%	155	38.56%	224	55.72%
Bachelor's (Grp 2)	2187	4.13	1.19	182	8.32%	1001	45.77%	1004	45.91%
Master's (Grp 3)	1789	4.31	1.13	97	5.42%	741	41.42%	951	53.16%
Doctorate (Grp 3)	198	4.40	1.17	14	7.07%	70	35.35%	114	57.58%
<b>Yrs Current Position</b>									
Less than 1	726	4.37	1.12	39	5.37%	289	39.81%	398	54.82%
1 - 5	2428	4.21	1.16	168	6.92%	1056	43.49%	1204	49.59%
6 - 10	1091	4.18	1.13	77	7.06%	502	46.01%	512	46.93%
11 - 15	472	4.22	1.24	42	8.90%	187	39.62%	243	51.48%
More than 15	470	4.38	1.14	26	5.53%	181	38.51%	263	55.96%
<b>Six Sigma Cert</b>									
No	2503	4.20	1.18	194	7.75%	1068	42.67%	1241	49.58%
Yes	2684	4.28	1.13	158	5.89%	1147	42.73%	1379	51.38%
<b>ASQ Cert</b>									
No	2386	4.29	1.17	164	6.87%	960	40.23%	1262	52.89%
Yes	2801	4.20	1.14	188	6.71%	1255	44.81%	1358	48.48%

<b>2. I find the work that I do full of meaning and purpose.</b>									
WE-Q2-DE				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.45	1.26	370	7.13%	1800	34.70%	3017	58.16%
<b>Gender</b>									
Female	2021	4.47	1.25	131	6.48%	709	35.08%	1181	58.44%
Male	3166	4.44	1.27	239	7.55%	1091	34.46%	1836	57.99%
<b>Org Level</b>									
Employee	1734	4.18	1.36	187	10.78%	702	40.48%	845	48.73%
Mid Mgmt	2270	4.50	1.20	136	5.99%	784	34.54%	1350	59.47%
Sr Mgmt	872	4.79	1.09	32	3.67%	219	25.11%	621	71.22%
<b>Age</b>									
19 – 25 (early)	61	3.98	1.37	8	13.11%	28	45.90%	25	40.98%
26 – 35 (early)	612	4.24	1.36	58	9.48%	267	43.63%	287	46.90%
36 – 45 (mid)	1274	4.32	1.30	115	9.03%	477	37.44%	682	53.53%
46 – 55 (mid)	1959	4.50	1.22	117	5.97%	652	33.28%	1190	60.75%
56 – 65 (late)	1120	4.61	1.21	68	6.07%	339	30.27%	713	63.66%
Over 65 (late)	160	4.93	1.05	4	2.50%	36	22.50%	120	75.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.52	1.26	23	7.10%	102	31.48%	199	61.42%
Tech (Grp 1)	287	4.48	1.20	18	6.27%	106	36.93%	163	56.79%
Associate (Grp 2)	402	4.50	1.26	30	7.46%	122	30.35%	250	62.19%
Bachelor's (Grp 2)	2187	4.35	1.29	180	8.23%	806	36.85%	1201	54.92%
Master's (Grp 3)	1789	4.52	1.22	111	6.20%	610	34.10%	1068	59.70%
Doctorate (Grp 3)	198	4.79	1.19	8	4.04%	54	27.27%	136	68.69%
<b>Yrs Current Position</b>									
Less than 1	726	4.53	1.21	46	6.34%	237	32.64%	443	61.02%
1 - 5	2428	4.41	1.27	182	7.50%	860	35.42%	1386	57.08%
6 - 10	1091	4.38	1.26	83	7.61%	406	37.21%	602	55.18%
11 - 15	472	4.51	1.32	33	6.99%	155	32.84%	284	60.17%
More than 15	470	4.65	1.20	26	5.53%	142	30.21%	302	64.26%
<b>Six Sigma Cert</b>									
No	2503	4.45	1.29	185	7.39%	871	34.80%	1447	57.81%
Yes	2684	4.46	1.23	185	6.89%	929	34.61%	1570	58.49%
<b>ASQ Cert</b>									
No	2386	4.51	1.28	166	6.96%	776	32.52%	1444	60.52%
Yes	2801	4.40	1.24	204	7.28%	1024	36.56%	1573	56.16%

<b>3. Time flies when I am working.</b>									
<b>WE-Q3-AB</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.87	1.08	160	3.08%	1219	23.50%	3808	73.41%
<b>Gender</b>									
Female	2021	4.86	1.09	61	3.02%	486	24.05%	1474	72.93%
Male	3166	4.87	1.07	99	3.13%	733	23.15%	2334	73.72%
<b>Org Level</b>									
Employee	1734	4.62	1.19	91	5.25%	525	30.28%	1118	64.48%
Mid Mgmt	2270	4.94	1.02	53	2.33%	486	21.41%	1731	76.26%
Sr Mgmt	872	5.11	0.91	9	1.03%	147	16.86%	716	82.11%
<b>Age</b>									
19 – 25 (early)	61	4.57	1.23	4	6.56%	22	36.07%	35	57.38%
26 – 35 (early)	612	4.63	1.18	28	4.58%	196	32.03%	388	63.40%
36 – 45 (mid)	1274	4.74	1.14	53	4.16%	349	27.39%	872	68.45%
46 – 55 (mid)	1959	4.92	1.04	49	2.50%	418	21.34%	1492	76.16%
56 – 65 (late)	1120	5.02	0.99	23	2.05%	204	18.21%	893	79.73%
Over 65 (late)	160	5.13	0.93	3	1.88%	29	18.13%	128	80.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.81	1.08	7	2.16%	92	28.40%	225	69.44%
Tech (Grp 1)	287	4.99	0.97	4	1.39%	56	19.51%	227	79.09%
Associate (Grp 2)	402	4.94	1.06	12	2.99%	76	18.91%	314	78.11%
Bachelor's (Grp 2)	2187	4.78	1.12	87	3.98%	556	25.42%	1544	70.60%
Master's (Grp 3)	1789	4.93	1.05	44	2.46%	404	22.58%	1341	74.96%
Doctorate (Grp 3)	198	5.03	1.01	6	3.03%	35	17.68%	157	79.29%
<b>Yrs Current Position</b>									
Less than 1	726	4.92	1.02	16	2.20%	163	22.45%	547	75.34%
1 - 5	2428	4.83	1.10	85	3.50%	595	24.51%	1748	71.99%
6 - 10	1091	4.82	1.08	36	3.30%	265	24.29%	790	72.41%
11 - 15	472	4.86	1.08	12	2.54%	116	24.58%	344	72.88%
More than 15	470	5.09	1.00	11	2.34%	80	17.02%	379	80.64%
<b>Six Sigma Cert</b>									
No	2503	4.87	1.08	74	2.96%	587	23.45%	1842	73.59%
Yes	2684	4.86	1.07	86	3.20%	632	23.55%	1966	73.25%
<b>ASQ Cert</b>									
No	2386	4.91	1.08	65	2.72%	543	22.76%	1778	74.52%
Yes	2801	4.83	1.08	95	3.39%	676	24.13%	2030	72.47%

<b>4. At my job, I feel strong and vigorous.</b>									
<b>WE-Q4-VI</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.35	1.20	388	7.48%	1940	37.40%	2859	55.12%
<b>Gender</b>									
Female	2021	4.32	1.21	158	7.82%	757	37.46%	1106	54.73%
Male	3166	4.36	1.20	230	7.26%	1183	37.37%	1753	55.37%
<b>Org Level</b>									
Employee	1734	4.10	1.31	195	11.25%	729	42.04%	810	46.71%
Mid Mgmt	2270	4.38	1.16	150	6.61%	855	37.67%	1265	55.73%
Sr Mgmt	872	4.67	1.03	28	3.21%	260	29.82%	584	66.97%
<b>Age</b>									
19 – 25 (early)	61	4.13	1.37	8	13.11%	26	42.62%	27	44.26%
26 – 35 (early)	612	4.15	1.29	60	9.80%	271	44.28%	281	45.92%
36 – 45 (mid)	1274	4.24	1.24	116	9.11%	498	39.09%	660	51.81%
46 – 55 (mid)	1959	4.35	1.18	129	6.58%	740	37.77%	1090	55.64%
56 – 65 (late)	1120	4.51	1.13	70	6.25%	366	32.68%	684	61.07%
Over 65 (late)	160	4.81	1.04	5	3.13%	38	23.75%	117	73.13%
<b>Education</b>									
GED/HS (Grp 1)	324	4.29	1.22	25	7.72%	123	37.96%	176	54.32%
Tech (Grp 1)	287	4.44	1.09	15	5.23%	105	36.59%	167	58.19%
Associate (Grp 2)	402	4.41	1.18	28	6.97%	143	35.57%	231	57.46%
Bachelor's (Grp 2)	2187	4.24	1.23	194	8.87%	871	39.83%	1122	51.30%
Master's (Grp 3)	1789	4.43	1.19	120	6.71%	633	35.38%	1036	57.91%
Doctorate (Grp 3)	198	4.65	1.09	6	3.03%	65	32.83%	127	64.14%
<b>Yrs Current Position</b>									
Less than 1	726	4.45	1.12	37	5.10%	276	38.02%	413	56.89%
1 - 5	2428	4.30	1.22	187	7.70%	933	38.43%	1308	53.87%
6 - 10	1091	4.29	1.22	92	8.43%	414	37.95%	585	53.62%
11 - 15	472	4.36	1.26	44	9.32%	159	33.69%	269	56.99%
More than 15	470	4.52	1.15	28	5.96%	158	33.62%	284	60.43%
<b>Six Sigma Cert</b>									
No	2503	4.33	1.23	199	7.95%	934	37.32%	1370	54.73%
Yes	2684	4.36	1.18	189	7.04%	1006	37.48%	1489	55.48%
<b>ASQ Cert</b>									
No	2386	4.39	1.21	163	6.83%	874	36.63%	1349	56.54%
Yes	2801	4.31	1.20	225	8.03%	1066	38.06%	1510	53.91%

<b>5. I am enthusiastic about my job.</b>									
WE-Q5-DE									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.53	1.25	349	6.73%	1653	31.87%	3185	61.40%
<b>Gender</b>									
Female	2021	4.56	1.24	124	6.14%	647	32.01%	1250	61.85%
Male	3166	4.52	1.26	225	7.11%	1006	31.78%	1935	61.12%
<b>Org Level</b>									
Employee	1734	4.26	1.37	181	10.44%	648	37.37%	905	52.19%
Mid Mgmt	2270	4.58	1.19	133	5.86%	712	31.37%	1425	62.78%
Sr Mgmt	872	4.88	1.05	22	2.52%	215	24.66%	635	72.82%
<b>Age</b>									
19 – 25 (early)	61	4.26	1.45	7	11.48%	25	40.98%	29	47.54%
26 – 35 (early)	612	4.30	1.38	65	10.62%	227	37.09%	320	52.29%
36 – 45 (mid)	1274	4.43	1.29	102	8.01%	429	33.67%	743	58.32%
46 – 55 (mid)	1959	4.56	1.21	108	5.51%	627	32.01%	1224	62.48%
56 – 65 (late)	1120	4.68	1.20	64	5.71%	312	27.86%	744	66.43%
Over 65 (late)	160	5.04	0.96	3	1.88%	32	20.00%	125	78.13%
<b>Education</b>									
GED/HS (Grp 1)	324	4.63	1.14	12	3.70%	104	32.10%	208	64.20%
Tech (Grp 1)	287	4.67	1.17	11	3.83%	89	31.01%	187	65.16%
Associate (Grp 2)	402	4.65	1.22	27	6.72%	101	25.12%	274	68.16%
Bachelor's (Grp 2)	2187	4.41	1.29	183	8.37%	767	35.07%	1237	56.56%
Master's (Grp 3)	1789	4.60	1.23	109	6.09%	538	30.07%	1142	63.83%
Doctorate (Grp 3)	198	4.81	1.21	7	3.54%	54	27.27%	137	69.19%
<b>Yrs Current Position</b>									
Less than 1	726	4.64	1.19	42	5.79%	201	27.69%	483	66.53%
1 - 5	2428	4.48	1.27	165	6.80%	829	34.14%	1434	59.06%
6 - 10	1091	4.51	1.26	83	7.61%	348	31.90%	660	60.49%
11 - 15	472	4.53	1.33	38	8.05%	140	29.66%	294	62.29%
More than 15	470	4.71	1.15	21	4.47%	135	28.72%	314	66.81%
<b>Six Sigma Cert</b>									
No	2503	4.51	1.27	174	6.95%	801	32.00%	1528	61.05%
Yes	2684	4.56	1.23	175	6.52%	852	31.74%	1657	61.74%
<b>ASQ Cert</b>									
No	2386	4.59	1.25	141	5.91%	727	30.47%	1518	63.62%
Yes	2801	4.49	1.25	208	7.43%	926	33.06%	1667	59.51%



<b>6. When I am working, I forget everything else around me.</b>									
WE-Q6-AB				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.94	1.41	805	15.52%	2038	39.29%	2344	45.19%
<b>Gender</b>									
Female	2021	4.05	1.40	278	13.76%	751	37.16%	992	49.08%
Male	3166	3.87	1.42	527	16.65%	1287	40.65%	1352	42.70%
<b>Org Level</b>									
Employee	1734	3.81	1.45	302	17.42%	729	42.04%	703	40.54%
Mid Mgmt	2270	3.93	1.41	369	16.26%	876	38.59%	1025	45.15%
Sr Mgmt	872	4.17	1.32	95	10.89%	315	36.12%	462	52.98%
<b>Age</b>									
19 – 25 (early)	61	3.54	1.65	17	27.87%	22	36.07%	22	36.07%
26 – 35 (early)	612	3.73	1.46	120	19.61%	273	44.61%	219	35.78%
36 – 45 (mid)	1274	3.81	1.44	225	17.66%	525	41.21%	524	41.13%
46 – 55 (mid)	1959	4.00	1.38	292	14.91%	736	37.57%	931	47.52%
56 – 65 (late)	1120	4.08	1.39	133	11.88%	423	37.77%	564	50.36%
Over 65 (late)	160	4.19	1.31	18	11.25%	58	36.25%	84	52.50%
<b>Education</b>									
GED/HS (Grp 1)	324	3.89	1.46	56	17.28%	124	38.27%	144	44.44%
Tech (Grp 1)	287	3.84	1.42	50	17.42%	114	39.72%	123	42.86%
Associate (Grp 2)	402	3.94	1.46	59	14.68%	153	38.06%	190	47.26%
Bachelor's (Grp 2)	2187	3.85	1.42	375	17.15%	897	41.02%	915	41.84%
Master's (Grp 3)	1789	4.03	1.37	244	13.64%	689	38.51%	856	47.85%
Doctorate (Grp 3)	198	4.34	1.38	21	10.61%	61	30.81%	116	58.59%
<b>Yrs Current Position</b>									
Less than 1	726	4.02	1.37	102	14.05%	295	40.63%	329	45.32%
1 - 5	2428	3.90	1.43	401	16.52%	936	38.55%	1091	44.93%
6 - 10	1091	3.93	1.36	162	14.85%	458	41.98%	471	43.17%
11 - 15	472	3.95	1.45	74	15.68%	181	38.35%	217	45.97%
More than 15	470	4.03	1.47	66	14.04%	168	35.74%	236	50.21%
<b>Six Sigma Cert</b>									
No	2503	3.90	1.44	413	16.50%	976	38.99%	1114	44.51%
Yes	2684	3.98	1.38	392	14.61%	1062	39.57%	1230	45.83%
<b>ASQ Cert</b>									
No	2386	3.93	1.44	383	16.05%	927	38.85%	1076	45.10%
Yes	2801	3.95	1.39	422	15.07%	1111	39.66%	1268	45.27%

<b>7. My job inspires me.</b>				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
WE-Q7-DE				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	<i>n</i>	M	SD						
<b>Total</b>	5187	4.08	1.38	676	13.03%	2117	40.81%	2394	46.15%
<b>Gender</b>									
Female	2021	4.08	1.39	264	13.06%	805	39.83%	952	47.11%
Male	3166	4.08	1.38	412	13.01%	1312	41.44%	1442	45.55%
<b>Org Level</b>									
Employee	1734	3.78	1.49	334	19.26%	743	42.85%	657	37.89%
Mid Mgmt	2270	4.11	1.32	260	11.45%	962	42.38%	1048	46.17%
Sr Mgmt	872	4.51	1.19	52	5.96%	293	33.60%	527	60.44%
<b>Age</b>									
19 – 25 (early)	61	3.70	1.68	15	24.59%	21	34.43%	25	40.98%
26 – 35 (early)	612	3.79	1.52	120	19.61%	269	43.95%	223	36.44%
36 – 45 (mid)	1274	3.95	1.40	188	14.76%	550	43.17%	536	42.07%
46 – 55 (mid)	1959	4.13	1.35	236	12.05%	789	40.28%	934	47.68%
56 – 65 (late)	1120	4.24	1.30	109	9.73%	431	38.48%	580	51.79%
Over 65 (late)	160	4.58	1.23	8	5.00%	56	35.00%	96	60.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.09	1.37	41	12.65%	131	40.43%	152	46.91%
Tech (Grp 1)	287	4.13	1.32	28	9.76%	127	44.25%	132	45.99%
Associate (Grp 2)	402	4.13	1.33	41	10.20%	173	43.03%	188	46.77%
Bachelor's (Grp 2)	2187	3.94	1.41	344	15.73%	920	42.07%	923	42.20%
Master's (Grp 3)	1789	4.18	1.35	206	11.51%	702	39.24%	881	49.25%
Doctorate (Grp 3)	198	4.51	1.34	16	8.08%	64	32.32%	118	59.60%
<b>Yrs Current Position</b>									
Less than 1	726	4.20	1.36	82	11.29%	287	39.53%	357	49.17%
1 - 5	2428	4.03	1.39	330	13.59%	1009	41.56%	1089	44.85%
6 - 10	1091	4.02	1.38	149	13.66%	459	42.07%	483	44.27%
11 - 15	472	4.13	1.42	68	14.41%	176	37.29%	228	48.31%
More than 15	470	4.23	1.33	47	10.00%	186	39.57%	237	50.43%
<b>Six Sigma Cert</b>									
No	2503	4.04	1.41	339	13.54%	1028	41.07%	1136	45.39%
Yes	2684	4.12	1.36	337	12.56%	1089	40.57%	1258	46.87%
<b>ASQ Cert</b>									
No	2386	4.15	1.39	295	12.36%	925	38.77%	1166	48.87%
Yes	2801	4.02	1.37	381	13.60%	1192	42.56%	1228	43.84%

<b>8. When I get up in the morning, I feel like going to work.</b>									
WE-Q8-VI				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.23	1.48	679	13.09%	1711	32.99%	2797	53.92%
<b>Gender</b>									
Female	2021	4.15	1.48	286	14.15%	686	33.94%	1049	51.90%
Male	3166	4.27	1.48	393	12.41%	1025	32.38%	1748	55.21%
<b>Org Level</b>									
Employee	1734	3.89	1.62	335	19.32%	619	35.70%	780	44.98%
Mid Mgmt	2270	4.29	1.42	267	11.76%	751	33.08%	1252	55.15%
Sr Mgmt	872	4.66	1.23	54	6.19%	237	27.18%	581	66.63%
<b>Age</b>									
19 – 25 (early)	61	3.48	1.83	18	29.51%	23	37.70%	20	32.79%
26 – 35 (early)	612	3.78	1.60	125	20.42%	239	39.05%	248	40.52%
36 – 45 (mid)	1274	4.03	1.50	211	16.56%	466	36.58%	597	46.86%
46 – 55 (mid)	1959	4.30	1.44	227	11.59%	622	31.75%	1110	56.66%
56 – 65 (late)	1120	4.51	1.36	96	8.57%	317	28.30%	707	63.13%
Over 65 (late)	160	4.83	1.12	2	1.25%	43	26.88%	115	71.88%
<b>Education</b>									
GED/HS (Grp 1)	324	4.14	1.48	43	13.27%	118	36.42%	163	50.31%
Tech (Grp 1)	287	4.32	1.45	32	11.15%	91	31.71%	164	57.14%
Associate (Grp 2)	402	4.27	1.45	53	13.18%	127	31.59%	222	55.22%
Bachelor's (Grp 2)	2187	4.09	1.54	333	15.23%	740	33.84%	1114	50.94%
Master's (Grp 3)	1789	4.34	1.42	203	11.35%	582	32.53%	1004	56.12%
Doctorate (Grp 3)	198	4.59	1.37	15	7.58%	53	26.77%	130	65.66%
<b>Yrs Current Position</b>									
Less than 1	726	4.31	1.43	91	12.53%	235	32.37%	400	55.10%
1 - 5	2428	4.16	1.49	336	13.84%	832	34.27%	1260	51.89%
6 - 10	1091	4.19	1.47	145	13.29%	371	34.01%	575	52.70%
11 - 15	472	4.26	1.55	68	14.41%	135	28.60%	269	56.99%
More than 15	470	4.49	1.41	39	8.30%	138	29.36%	293	62.34%
<b>Six Sigma Cert</b>									
No	2503	4.18	1.52	354	14.14%	799	31.92%	1350	53.94%
Yes	2684	4.27	1.44	325	12.11%	912	33.98%	1447	53.91%
<b>ASQ Cert</b>									
No	2386	4.29	1.48	299	12.53%	737	30.89%	1350	56.58%
Yes	2801	4.17	1.48	380	13.57%	974	34.77%	1447	51.66%

<b>9. I feel happy when I am working intensely.</b>									
<b>WE-Q9-AB</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.68	1.11	184	3.55%	1603	30.90%	3400	65.55%
<b>Gender</b>									
Female	2021	4.70	1.11	70	3.46%	599	29.64%	1352	66.90%
Male	3166	4.66	1.12	114	3.60%	1004	31.71%	2048	64.69%
<b>Org Level</b>									
Employee	1734	4.48	1.19	90	5.19%	639	36.85%	1005	57.96%
Mid Mgmt	2270	4.70	1.09	75	3.30%	683	30.09%	1512	66.61%
Sr Mgmt	872	4.96	0.94	12	1.38%	192	22.02%	668	76.61%
<b>Age</b>									
19 – 25 (early)	61	4.61	1.37	4	6.56%	21	34.43%	36	59.02%
26 – 35 (early)	612	4.52	1.17	28	4.58%	222	36.27%	362	59.15%
36 – 45 (mid)	1274	4.60	1.18	56	4.40%	425	33.36%	793	62.24%
46 – 55 (mid)	1959	4.68	1.08	67	3.42%	581	29.66%	1311	66.92%
56 – 65 (late)	1120	4.79	1.05	29	2.59%	311	27.77%	780	69.64%
Over 65 (late)	160	4.99	0.89	0	0.00%	42	26.25%	118	73.75%
<b>Education</b>									
GED/HS (Grp 1)	324	4.69	1.10	9	2.78%	101	31.17%	214	66.05%
Tech (Grp 1)	287	4.72	1.07	5	1.74%	91	31.71%	191	66.55%
Associate (Grp 2)	402	4.74	1.07	14	3.48%	111	27.61%	277	68.91%
Bachelor's (Grp 2)	2187	4.58	1.15	93	4.25%	739	33.79%	1355	61.96%
Master's (Grp 3)	1789	4.75	1.09	59	3.30%	511	28.56%	1219	68.14%
Doctorate (Grp 3)	198	4.87	1.06	4	2.02%	50	25.25%	144	72.73%
<b>Yrs Current Position</b>									
Less than 1	726	4.72	1.17	34	4.68%	208	28.65%	484	66.67%
1 - 5	2428	4.67	1.10	76	3.13%	763	31.43%	1589	65.44%
6 - 10	1091	4.62	1.11	44	4.03%	357	32.72%	690	63.24%
11 - 15	472	4.70	1.11	20	4.24%	127	26.91%	325	68.86%
More than 15	470	4.77	1.09	10	2.13%	148	31.49%	312	66.38%
<b>Six Sigma Cert</b>									
No	2503	4.65	1.14	97	3.88%	771	30.80%	1635	65.32%
Yes	2684	4.70	1.09	87	3.24%	832	31.00%	1765	65.76%
<b>ASQ Cert</b>									
No	2386	4.74	1.10	76	3.19%	686	28.75%	1624	68.06%
Yes	2801	4.63	1.12	108	3.86%	917	32.74%	1776	63.41%

<b>10. I am proud of the work that I do.</b>									
WE-Q10-DE				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	5.02	1.06	127	2.45%	1088	20.98%	3972	76.58%
<b>Gender</b>									
Female	2021	5.07	1.03	39	1.93%	416	20.58%	1566	77.49%
Male	3166	5.00	1.07	88	2.78%	672	21.23%	2406	75.99%
<b>Org Level</b>									
Employee	1734	4.84	1.20	73	4.21%	453	26.12%	1208	69.67%
Mid Mgmt	2270	5.06	0.99	39	1.72%	450	19.82%	1781	78.46%
Sr Mgmt	872	5.27	0.86	6	0.69%	123	14.11%	743	85.21%
<b>Age</b>									
19 – 25 (early)	61	4.67	1.25	3	4.92%	22	36.07%	36	59.02%
26 – 35 (early)	612	4.85	1.17	23	3.76%	160	26.14%	429	70.10%
36 – 45 (mid)	1274	4.93	1.09	40	3.14%	306	24.02%	928	72.84%
46 – 55 (mid)	1959	5.04	1.05	43	2.19%	385	19.65%	1531	78.15%
56 – 65 (late)	1120	5.17	0.96	18	1.61%	193	17.23%	909	81.16%
Over 65 (late)	160	5.34	0.77	0	0.00%	21	13.13%	139	86.88%
<b>Education</b>									
GED/HS (Grp 1)	324	5.10	0.97	4	1.23%	65	20.06%	255	78.70%
Tech (Grp 1)	287	5.11	0.99	4	1.39%	58	20.21%	225	78.40%
Associate (Grp 2)	402	5.19	0.97	5	1.24%	69	17.16%	328	81.59%
Bachelor's (Grp 2)	2187	4.95	1.11	67	3.06%	507	23.18%	1613	73.75%
Master's (Grp 3)	1789	5.03	1.04	44	2.46%	358	20.01%	1387	77.53%
Doctorate (Grp 3)	198	5.21	0.95	3	1.52%	31	15.66%	164	82.83%
<b>Yrs Current Position</b>									
Less than 1	726	5.01	1.07	24	3.31%	136	18.73%	566	77.96%
1 - 5	2428	4.98	1.09	65	2.68%	541	22.28%	1822	75.04%
6 - 10	1091	5.04	1.02	21	1.92%	231	21.17%	839	76.90%
11 - 15	472	5.06	1.05	10	2.12%	101	21.40%	361	76.48%
More than 15	470	5.18	0.93	7	1.49%	79	16.81%	384	81.70%
<b>Six Sigma Cert</b>									
No	2503	5.04	1.07	61	2.44%	516	20.62%	1926	76.95%
Yes	2684	5.01	1.04	66	2.46%	572	21.31%	2046	76.23%
<b>ASQ Cert</b>									
No	2386	5.06	1.07	58	2.43%	465	19.49%	1863	78.08%
Yes	2801	4.99	1.05	69	2.46%	623	22.24%	2109	75.29%

<b>11. I am immersed in my work.</b>									
WE-Q11-AB				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.69	1.10	211	4.07%	1498	28.88%	3478	67.05%
<b>Gender</b>									
Female	2021	4.76	1.08	76	3.76%	528	26.13%	1417	70.11%
Male	3166	4.64	1.11	135	4.26%	970	30.64%	2061	65.10%
<b>Org Level</b>									
Employee	1734	4.46	1.20	111	6.40%	611	35.24%	1012	58.36%
Mid Mgmt	2270	4.75	1.05	78	3.44%	623	27.44%	1569	69.12%
Sr Mgmt	872	4.99	0.92	12	1.38%	179	20.53%	681	78.10%
<b>Age</b>									
19 – 25 (early)	61	4.31	1.31	5	8.20%	26	42.62%	30	49.18%
26 – 35 (early)	612	4.51	1.20	37	6.05%	215	35.13%	360	58.82%
36 – 45 (mid)	1274	4.59	1.13	64	5.02%	403	31.63%	807	63.34%
46 – 55 (mid)	1959	4.72	1.09	74	3.78%	534	27.26%	1351	68.96%
56 – 65 (late)	1120	4.81	1.03	29	2.59%	283	25.27%	808	72.14%
Over 65 (late)	160	4.96	0.95	2	1.25%	36	22.50%	122	76.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.75	1.05	8	2.47%	91	28.09%	225	69.44%
Tech (Grp 1)	287	4.67	1.04	9	3.14%	92	32.06%	186	64.81%
Associate (Grp 2)	402	4.77	1.08	16	3.98%	99	24.63%	287	71.39%
Bachelor's (Grp 2)	2187	4.59	1.13	108	4.94%	679	31.05%	1400	64.01%
Master's (Grp 3)	1789	4.75	1.08	64	3.58%	487	27.22%	1238	69.20%
Doctorate (Grp 3)	198	4.91	1.13	6	3.03%	50	25.25%	142	71.72%
<b>Yrs Current Position</b>									
Less than 1	726	4.67	1.12	37	5.10%	202	27.82%	487	67.08%
1 - 5	2428	4.66	1.12	109	4.49%	725	29.86%	1594	65.65%
6 - 10	1091	4.70	1.06	34	3.12%	330	30.25%	727	66.64%
11 - 15	472	4.66	1.16	21	4.45%	128	27.12%	323	68.43%
More than 15	470	4.88	1.01	10	2.13%	113	24.04%	347	73.83%
<b>Six Sigma Cert</b>									
No	2503	4.69	1.12	107	4.27%	703	28.09%	1693	67.64%
Yes	2684	4.69	1.09	104	3.87%	795	29.62%	1785	66.51%
<b>ASQ Cert</b>									
No	2386	4.73	1.10	87	3.65%	651	27.28%	1648	69.07%
Yes	2801	4.65	1.10	124	4.43%	847	30.24%	1830	65.33%

<b>12. I can continue working for very long periods at a time.</b>									
WE-Q12-VI				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.72	1.10	207	3.99%	1441	27.78%	3539	68.23%
<b>Gender</b>									
Female	2021	4.80	1.07	69	3.41%	506	25.04%	1446	71.55%
Male	3166	4.67	1.11	138	4.36%	935	29.53%	2093	66.11%
<b>Org Level</b>									
Employee	1734	4.50	1.19	105	6.06%	596	34.37%	1033	59.57%
Mid Mgmt	2270	4.78	1.06	75	3.30%	577	25.42%	1618	71.28%
Sr Mgmt	872	4.96	0.97	21	2.41%	179	20.53%	672	77.06%
<b>Age</b>									
19 – 25 (early)	61	4.56	1.27	5	8.20%	20	32.79%	36	59.02%
26 – 35 (early)	612	4.57	1.13	24	3.92%	213	34.80%	375	61.27%
36 – 45 (mid)	1274	4.63	1.15	68	5.34%	380	29.83%	826	64.84%
46 – 55 (mid)	1959	4.77	1.08	71	3.62%	497	25.37%	1391	71.01%
56 – 65 (late)	1120	4.78	1.06	36	3.21%	296	26.43%	788	70.36%
Over 65 (late)	160	4.92	0.95	3	1.88%	35	21.88%	122	76.25%
<b>Education</b>									
GED/HS (Grp 1)	324	4.84	1.04	7	2.16%	86	26.54%	231	71.30%
Tech (Grp 1)	287	4.75	1.00	7	2.44%	85	29.62%	195	67.94%
Associate (Grp 2)	402	4.91	0.95	8	1.99%	87	21.64%	307	76.37%
Bachelor's (Grp 2)	2187	4.63	1.14	112	5.12%	639	29.22%	1436	65.66%
Master's (Grp 3)	1789	4.75	1.10	67	3.75%	498	27.84%	1224	68.42%
Doctorate (Grp 3)	198	4.83	1.08	6	3.03%	46	23.23%	146	73.74%
<b>Yrs Current Position</b>									
Less than 1	726	4.70	1.09	31	4.27%	192	26.45%	503	69.28%
1 - 5	2428	4.69	1.12	106	4.37%	691	28.46%	1631	67.17%
6 - 10	1091	4.71	1.08	40	3.67%	319	29.24%	732	67.09%
11 - 15	472	4.75	1.06	17	3.60%	122	25.85%	333	70.55%
More than 15	470	4.87	1.06	13	2.77%	117	24.89%	340	72.34%
<b>Six Sigma Cert</b>									
No	2503	4.73	1.10	100	4.00%	687	27.45%	1716	68.56%
Yes	2684	4.71	1.10	107	3.99%	754	28.09%	1823	67.92%
<b>ASQ Cert</b>									
No	2386	4.78	1.07	85	3.56%	616	25.82%	1685	70.62%
Yes	2801	4.67	1.12	122	4.36%	825	29.45%	1854	66.19%

<b>13. To me, my job is challenging.</b>									
WE-Q13-DE									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.51	1.29	395	7.62%	1680	32.39%	3112	60.00%
<b>Gender</b>									
Female	2021	4.54	1.29	143	7.08%	654	32.36%	1224	60.56%
Male	3166	4.49	1.30	252	7.96%	1026	32.41%	1888	59.63%
<b>Org Level</b>									
Employee	1734	4.24	1.38	195	11.25%	648	37.37%	891	51.38%
Mid Mgmt	2270	4.59	1.23	139	6.12%	715	31.50%	1416	62.38%
Sr Mgmt	872	4.82	1.14	38	4.36%	217	24.89%	617	70.76%
<b>Age</b>									
19 – 25 (early)	61	4.18	1.55	9	14.75%	26	42.62%	26	42.62%
26 – 35 (early)	612	4.23	1.36	68	11.11%	247	40.36%	297	48.53%
36 – 45 (mid)	1274	4.37	1.34	118	9.26%	453	35.56%	703	55.18%
46 – 55 (mid)	1959	4.58	1.26	125	6.38%	617	31.50%	1217	62.12%
56 – 65 (late)	1120	4.68	1.22	66	5.89%	295	26.34%	759	67.77%
Over 65 (late)	160	4.76	1.15	9	5.63%	41	25.63%	110	68.75%
<b>Education</b>									
GED/HS (Grp 1)	324	4.54	1.25	19	5.86%	112	34.57%	193	59.57%
Tech (Grp 1)	287	4.62	1.20	11	3.83%	99	34.49%	177	61.67%
Associate (Grp 2)	402	4.52	1.28	30	7.46%	122	30.35%	250	62.19%
Bachelor's (Grp 2)	2187	4.46	1.30	180	8.23%	722	33.01%	1285	58.76%
Master's (Grp 3)	1789	4.52	1.31	143	7.99%	571	31.92%	1075	60.09%
Doctorate (Grp 3)	198	4.75	1.21	12	6.06%	54	27.27%	132	66.67%
<b>Yrs Current Position</b>									
Less than 1	726	4.63	1.27	48	6.61%	208	28.65%	470	64.74%
1 - 5	2428	4.46	1.31	200	8.24%	815	33.57%	1413	58.20%
6 - 10	1091	4.47	1.29	89	8.16%	373	34.19%	629	57.65%
11 - 15	472	4.47	1.33	36	7.63%	152	32.20%	284	60.17%
More than 15	470	4.71	1.18	22	4.68%	132	28.09%	316	67.23%
<b>Six Sigma Cert</b>									
No	2503	4.52	1.30	184	7.35%	810	32.36%	1509	60.29%
Yes	2684	4.50	1.29	211	7.86%	870	32.41%	1603	59.72%
<b>ASQ Cert</b>									
No	2386	4.54	1.30	180	7.54%	732	30.68%	1474	61.78%
Yes	2801	4.48	1.28	215	7.68%	948	33.85%	1638	58.48%



<b>14. I get carried away when I am working.</b>									
WE-Q14-AB				Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
	<i>n</i>	M	SD	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.82	1.38	843	16.25%	2358	45.46%	1986	38.29%
<b>Gender</b>									
Female	2021	3.93	1.37	279	13.81%	895	44.29%	847	41.91%
Male	3166	3.75	1.38	564	17.81%	1463	46.21%	1139	35.98%
<b>Org Level</b>									
Employee	1734	3.61	1.41	340	19.61%	845	48.73%	549	31.66%
Mid Mgmt	2270	3.87	1.37	357	15.73%	1003	44.19%	910	40.09%
Sr Mgmt	872	4.10	1.27	98	11.24%	367	42.09%	407	46.67%
<b>Age</b>									
19 – 25 (early)	61	3.66	1.48	11	18.03%	32	52.46%	18	29.51%
26 – 35 (early)	612	3.67	1.38	112	18.30%	303	49.51%	197	32.19%
36 – 45 (mid)	1274	3.75	1.40	228	17.90%	584	45.84%	462	36.26%
46 – 55 (mid)	1959	3.86	1.35	295	15.06%	895	45.69%	769	39.25%
56 – 65 (late)	1120	3.91	1.40	175	15.63%	473	42.23%	472	42.14%
Over 65 (late)	160	3.91	1.41	22	13.75%	70	43.75%	68	42.50%
<b>Education</b>									
GED/HS (Grp 1)	324	3.82	1.39	52	16.05%	151	46.60%	121	37.35%
Tech (Grp 1)	287	3.83	1.37	44	15.33%	130	45.30%	113	39.37%
Associate (Grp 2)	402	3.90	1.43	55	13.68%	173	43.03%	174	43.28%
Bachelor's (Grp 2)	2187	3.70	1.39	403	18.43%	1040	47.55%	744	34.02%
Master's (Grp 3)	1789	3.90	1.36	266	14.87%	792	44.27%	731	40.86%
Doctorate (Grp 3)	198	4.20	1.28	23	11.62%	72	36.36%	103	52.02%
<b>Yrs Current Position</b>									
Less than 1	726	3.88	1.38	105	14.46%	341	46.97%	280	38.57%
1 - 5	2428	3.79	1.37	397	16.35%	1134	46.71%	897	36.94%
6 - 10	1091	3.80	1.35	177	16.22%	512	46.93%	402	36.85%
11 - 15	472	3.82	1.46	89	18.86%	188	39.83%	195	41.31%
More than 15	470	3.93	1.44	75	15.96%	183	38.94%	212	45.11%
<b>Six Sigma Cert</b>									
No	2503	3.81	1.41	407	16.26%	1111	44.39%	985	39.35%
Yes	2684	3.82	1.35	436	16.24%	1247	46.46%	1001	37.30%
<b>ASQ Cert</b>									
No	2386	3.89	1.36	351	14.71%	1081	45.31%	954	39.98%
Yes	2801	3.76	1.40	492	17.57%	1277	45.59%	1032	36.84%

<b>15. At my job, I am very resilient, mentally.</b>									
<b>WE-Q15-VI</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.62	1.10	201	3.88%	1705	32.87%	3281	63.25%
<b>Gender</b>									
Female	2021	4.59	1.12	81	4.01%	679	33.60%	1261	62.39%
Male	3166	4.64	1.10	120	3.79%	1026	32.41%	2020	63.80%
<b>Org Level</b>									
Employee	1734	4.39	1.21	107	6.17%	694	40.02%	933	53.81%
Mid Mgmt	2270	4.67	1.05	70	3.08%	717	31.59%	1483	65.33%
Sr Mgmt	872	4.93	0.92	12	1.38%	199	22.82%	661	75.80%
<b>Age</b>									
19 – 25 (early)	61	4.08	1.48	10	16.39%	22	36.07%	29	47.54%
26 – 35 (early)	612	4.41	1.25	43	7.03%	229	37.42%	340	55.56%
36 – 45 (mid)	1274	4.57	1.14	54	4.24%	444	34.85%	776	60.91%
46 – 55 (mid)	1959	4.64	1.06	61	3.11%	647	33.03%	1251	63.86%
56 – 65 (late)	1120	4.77	1.02	30	2.68%	309	27.59%	781	69.73%
Over 65 (late)	160	4.73	1.01	3	1.88%	53	33.13%	104	65.00%
<b>Education</b>									
GED/HS (Grp 1)	324	4.56	1.09	12	3.70%	119	36.73%	193	59.57%
Tech (Grp 1)	287	4.53	1.15	12	4.18%	96	33.45%	179	62.37%
Associate (Grp 2)	402	4.67	1.09	14	3.48%	129	32.09%	259	64.43%
Bachelor's (Grp 2)	2187	4.57	1.10	92	4.21%	752	34.39%	1343	61.41%
Master's (Grp 3)	1789	4.67	1.10	64	3.58%	559	31.25%	1166	65.18%
Doctorate (Grp 3)	198	4.78	1.08	7	3.54%	50	25.25%	141	71.21%
<b>Yrs Current Position</b>									
Less than 1	726	4.63	1.09	26	3.58%	232	31.96%	468	64.46%
1 - 5	2428	4.60	1.13	105	4.32%	796	32.78%	1527	62.89%
6 - 10	1091	4.60	1.07	40	3.67%	380	34.83%	671	61.50%
11 - 15	472	4.62	1.12	17	3.60%	165	34.96%	290	61.44%
More than 15	470	4.76	1.02	13	2.77%	132	28.09%	325	69.15%
<b>Six Sigma Cert</b>									
No	2503	4.60	1.12	99	3.96%	834	33.32%	1570	62.72%
Yes	2684	4.64	1.09	102	3.80%	871	32.45%	1711	63.75%
<b>ASQ Cert</b>									
No	2386	4.65	1.13	95	3.98%	742	31.10%	1549	64.92%
Yes	2801	4.59	1.08	106	3.78%	963	34.38%	1732	61.84%

<b>16. It is difficult to detach myself from my job.</b>									
<b>WE-Q16-AB</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	3.29	1.61	1607	30.98%	2154	41.53%	1426	27.49%
<b>Gender</b>									
Female	2021	3.30	1.60	623	30.83%	832	41.17%	566	28.01%
Male	3166	3.29	1.61	984	31.08%	1322	41.76%	860	27.16%
<b>Org Level</b>									
Employee	1734	3.02	1.63	660	38.06%	686	39.56%	388	22.38%
Mid Mgmt	2270	3.36	1.57	653	28.77%	982	43.26%	635	27.97%
Sr Mgmt	872	3.66	1.56	198	22.71%	357	40.94%	317	36.35%
<b>Age</b>									
19 – 25 (early)	61	3.25	1.56	18	29.51%	29	47.54%	14	22.95%
26 – 35 (early)	612	3.15	1.68	227	37.09%	223	36.44%	162	26.47%
36 – 45 (mid)	1274	3.28	1.63	417	32.73%	500	39.25%	357	28.02%
46 – 55 (mid)	1959	3.31	1.59	589	30.07%	833	42.52%	537	27.41%
56 – 65 (late)	1120	3.34	1.58	312	27.86%	499	44.55%	309	27.59%
Over 65 (late)	160	3.40	1.55	44	27.50%	69	43.13%	47	29.38%
<b>Education</b>									
GED/HS (Grp 1)	324	3.35	1.66	89	27.47%	138	42.59%	97	29.94%
Tech (Grp 1)	287	3.23	1.57	94	32.75%	121	42.16%	72	25.09%
Associate (Grp 2)	402	3.22	1.59	120	29.85%	185	46.02%	97	24.13%
Bachelor's (Grp 2)	2187	3.20	1.60	725	33.15%	897	41.02%	565	25.83%
Master's (Grp 3)	1789	3.39	1.61	527	29.46%	725	40.53%	537	30.02%
Doctorate (Grp 3)	198	3.51	1.58	52	26.26%	88	44.44%	58	29.29%
<b>Yrs Current Position</b>									
Less than 1	726	3.25	1.59	225	30.99%	313	43.11%	188	25.90%
1 - 5	2428	3.25	1.60	775	31.92%	1008	41.52%	645	26.57%
6 - 10	1091	3.36	1.60	331	30.34%	439	40.24%	321	29.42%
11 - 15	472	3.27	1.66	143	30.30%	200	42.37%	129	27.33%
More than 15	470	3.38	1.64	133	28.30%	194	41.28%	143	30.43%
<b>Six Sigma Cert</b>									
No	2503	3.29	1.64	793	31.68%	1001	39.99%	709	28.33%
Yes	2684	3.29	1.57	814	30.33%	1153	42.96%	717	26.71%
<b>ASQ Cert</b>									
No	2386	3.36	1.60	685	28.71%	1011	42.37%	690	28.92%
Yes	2801	3.23	1.61	922	32.92%	1143	40.81%	736	26.28%

<b>17. At my work, I always persevere, even when things do not go well.</b>									
<b>WE-Q17-VI</b>									
	<i>n</i>	M	SD	Never, Almost Never or Rarely		Sometimes or Often		Very Often or Always	
				<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Total</b>	5187	4.78	1.03	95	1.83%	1688	32.54%	3404	65.63%
<b>Gender</b>									
Female	2021	4.81	1.02	39	1.93%	626	30.97%	1356	67.10%
Male	3166	4.76	1.03	56	1.77%	1062	33.54%	2048	64.69%
<b>Org Level</b>									
Employee	1734	4.60	1.09	45	2.60%	689	39.73%	1000	57.67%
Mid Mgmt	2270	4.80	1.00	40	1.76%	707	31.15%	1523	67.09%
Sr Mgmt	872	5.09	0.87	3	0.34%	195	22.36%	674	77.29%
<b>Age</b>									
19 – 25 (early)	61	4.43	1.07	2	3.28%	28	45.90%	31	50.82%
26 – 35 (early)	612	4.62	1.08	15	2.45%	240	39.22%	357	58.33%
36 – 45 (mid)	1274	4.76	1.01	22	1.73%	435	34.14%	817	64.13%
46 – 55 (mid)	1959	4.80	1.02	38	1.94%	608	31.04%	1313	67.02%
56 – 65 (late)	1120	4.89	1.00	18	1.61%	323	28.84%	779	69.55%
Over 65 (late)	160	4.84	0.95	0	0.00%	53	33.13%	107	66.88%
<b>Education</b>									
GED/HS (Grp 1)	324	4.69	1.06	8	2.47%	114	35.19%	202	62.35%
Tech (Grp 1)	287	4.74	1.05	7	2.44%	94	32.75%	186	64.81%
Associate (Grp 2)	402	4.75	1.00	10	2.49%	128	31.84%	264	65.67%
Bachelor's (Grp 2)	2187	4.74	1.05	42	1.92%	752	34.39%	1393	63.69%
Master's (Grp 3)	1789	4.84	0.99	25	1.40%	559	31.25%	1205	67.36%
Doctorate (Grp 3)	198	5.03	0.96	3	1.52%	41	20.71%	154	77.78%
<b>Yrs Current Position</b>									
Less than 1	726	4.81	0.98	9	1.24%	225	30.99%	492	67.77%
1 - 5	2428	4.76	1.04	51	2.10%	819	33.73%	1558	64.17%
6 - 10	1091	4.81	1.00	16	1.47%	343	31.44%	732	67.09%
11 - 15	472	4.81	1.07	11	2.33%	144	30.51%	317	67.16%
More than 15	470	4.79	1.03	8	1.70%	157	33.40%	305	64.89%
<b>Six Sigma Cert</b>									
No	2503	4.78	1.05	56	2.24%	804	32.12%	1643	65.64%
Yes	2684	4.79	1.00	39	1.45%	884	32.94%	1761	65.61%
<b>ASQ Cert</b>									
No	2386	4.82	1.03	47	1.97%	712	29.84%	1627	68.19%
Yes	2801	4.75	1.02	48	1.71%	976	34.84%	1777	63.44%