Emotional versus Cognitive Intelligence: Which is the better predictor of Efficacy for Working in Teams?

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Abstract

This study compares the contribution of emotional intelligence (EQ) versus cognitive intelligence (IQ) to efficacy for team work (ETW). Management students working in self-managing teams completed 2 measures of both EQ (Scutte and Baron-EQI) and IQ (Wonderlic and Watson-Glaser). The Williams T2 test was used to test for significant differences in correlations between EWT and both EQ and IQ. Hierarchical regression was used to test whether EQ remains a significant predictor of ETW after controlling for IQ, and whether EQ moderates the relationship between IQ and ETW. Both IQ and EQ are statistically significant predictors of ETW, but EQ is a more significant predictor than IQ, and remains significant after controlling for the influence of IQ. EQ does not moderate the relationship between IQ and efficacy for team work.

Keywords: Emotional Intelligence, Cognitive Intelligence, Efficacy for Team Work

Introduction

A significant change is taking place in organizational design and management with greater emphasis on structural flexibility and employee participation (Guthrie, 2001; Pendleton, 2010; Smith, 1997; Stronzniak, 2000). The centerpiece of this change is the use of self-managing teams (Greg, 2006; Kuipers & Stoker, 2009; Muthusamy, Wheeler & Simmons, 2005; Yandrick, 2001). Self-managing teams have been implemented within many fortune 1,000 companies (Stewart, Manz & Simms, 1999) and remain the cornerstone of many organizational development strategies (Day, Gron & Salas, 2006).

The movement away from individual job descriptions with clear and stable boundaries to more fluid team based roles has increased the need for employees who can perform effectively in a team environment (Muthusamy et al., 2005; Nederveen & Knippenberg, 2013; Neuman & Wright, 1999). This has increased the importance of understanding the key determinants of team member effectiveness (Humphrey, Stephens & Summers, 2012; Siau, Tan & Sheng, 2010) and

has produced a rapid expansion in research on team member characteristics (Ammeter & Dukerish, 2002; Liu, Keller & Shih, 2011).

Team member characteristics are generally divided into behavioral proclivities like conflict management style; proximal psychological states like beliefs, values and perceptual patterns; and more distal or deeper general psychological states like intelligence. Psychological states are generally viewed as a significant determinant of perception and subsequent behavior, and are therefore of interest to both researchers and practitioners, particularly those states that can be reliably shaped by external forces.

Cognitive Intelligence vs Emotional Intelligence

Much of the organizational research on the contribution of general (distal) psychological states to performance has focused on the impact of cognitive intelligence (IQ) on individual performance in the workplace. This research has consistently revealed significant positive correlations, but these correlations have been lower than expected resulting in the ongoing search for other general states (Schmidt & Hunter, 2004). Recently, the fundamental group of human intelligences proposed by the developmental psychologist Howard Gardner (Gardner, 1983) was expanded to include emotional intelligence (EQ) (Goleman 1995, Salovey & Mayer, 1990). Initial research on emotional intelligence as a predictor of individual behavior and performance in the workplace has provided promising results (Rozell, Pettijohn & Parker, 2006; Suliman & Al-Shaikh, 2007), and more recent research suggests that average levels of emotional intelligence among team members and the emotional intelligence of team leaders are strong predictors of team performance (Chang, Sy & Choi, 2012; Koman & Wolff, 2008).

These results highlight the importance of understanding the role that emotional intelligence plays within the nomological network that determines team member and team performance. One of the key variables within this network is efficacy for team work which is considered to be an important predictor of team and team member performance (Taikovic & Luthans, 1998). This empirical research study examines the impact of cognitive and emotional intelligence on efficacy for working in teams.

Efficacy for Working in Teams

Social cognitive theory (Bandura, 1986) suggests that cognitive processing of social information can influence human performance. Beliefs about one's ability to mobilize sufficient effort, cognitive resources and the behavioral strategies necessary for successful task completion are considered important determinants of performance and satisfaction (Bandura, 1997). Self-efficacy is generally defined as the perceived capability for performing a specific task (Wood & Bandura, 1989). Self-efficacy may be improved through positive mastery experiences, the observation of similar others succeeding with sustained effort, receiving realistic encouragement from a credible source, and the perception of being in a performance ready state (physiological and psychological) (Bandura & Schunk, 1989; Wood & Bandura, 1989). These general determinants influence self efficacy through a process of cognitive evaluation (Gist & Mitchell, 1992).

Positive or negative efficacy information is generated by evaluating the task requirements and related personal experiences. Further information is generated through the process of evaluating available resources and other personal and situation constraints. Research has

confirmed self-efficacy as a valid predictor of satisfaction, effort, persistence and success across a wide range of tasks (Gist & Mitchell, 1992; Lennings, 1994; Stajkovic & Luthans, 1998) including team work (Chowdhury, Endres and Lanis, 2002; Phillips, 2001; Cohen and Bailey, 1997).

Productive and satisfying team experiences reinforce both efficacy for working in teams and the desire to work in teams (Cohen & Bailey, 1997). Research has confirmed that efficacy for working in teams is a critical self perception that promotes team member effectiveness and overall team performance (Chowdhury et al., 2002; Phillips, 2001; Hyatt and Ruddy, 1997).

Emotional Intelligence

Intelligence underlies one's capacity to perceive, think, feel and act in a way that effectively manages environmental demands and helps achieve constructive outcomes (Byington & Felps, 2010). Much of the traditional research on intelligence and performance has focused on the role of cognitive intelligence (IQ), which is defined as the capacity to understand, learn, recall, think rationally and solve problems (Kaplan & Sadock, 1991). Gardner (1983) expanded on the concept of cognitive intelligence by suggesting that intelligence encompasses both cognitive and personal (emotional) elements. The personal (emotional) component includes two general components referred to as intrapsychic and interpersonal skills.

Salovey and Mayer (1990) referred to the intrapsychic and interpersonal components as emotional intelligence (EI) and generally defined EI as the ability to perceive, understand, express, facilitate and manage emotions in oneself and others. Goleman (1995) popularized the concept and proposed that EI might be a better predictor of individual performance than IQ in a wide range of situations (Goleman, 1996). Goleman (1995) defines EI as the capacity to recognize and manage emotions in ourselves and others which helps us to cope with environmental demands and pressures (Dulewicz & Higgs, 2000).

The increasing popularity of the construct has not been accompanied by increasing stabilization of the content and structure of the construct (Keefer, 2015). Current attempts at defining, operationalizing and measuring the construct have been criticized as being too general resulting in construct boundaries that potentially encompass multiple constructs and produce research results that are difficult to interpret. This type of construct validation challenge is not unusual for distal or foundational psychological constructs that are difficult to measure directly, are often multi-dimensional, and manifest in a wide range of perceptions, inner experiences and behaviors (Orchard, et al., 2009).

Deciding which of the various manifestations of a construct is sufficiently close to the underlying factor(s) to be considered on the inside of the construct boundary requires continuing attempts at measuring and correlating the construct. This raises the issue of how to conduct empirical research involving an emerging and complex construct like EQ. Jordan, Ashton-James & Ashkanasybe (2006) suggest that in order for an operationalization of EQ to be considered credible during the emergent stage of the construct, the content of the construct should directly refer to the original criteria suggested and later updated by Salovey and Mayer (1990, 1997). This criteria focuses on perception, awareness, understanding, expression, facilitation and management of emotion within oneself and supporting others to do the same.

Emotional intelligence is typically measured using either an omnibus test or tests that explicitly measure proposed dimensions of the construct. For the purpose of this research, both an omnibus and a multi-dimensional measure of emotional intelligence were selected after a review of the available instruments was conducted. The review was conducted to determine (1) the extent to which the instrument made reference to the original criteria proposed and later updated by Salovey and Mayer (1990, 1997), (2) the extend of instrument validation, and (3) the ability to use the instrument within the current research context. Both the Schutte (Schutte, Malouff, Hall, Haggerty, Cooper & Golden, 1998) and the Baron-EQI measures of EQ were selected for inclusion in this study. The multifactor emotional intelligence scale (MEIS) (Mayer, Salovey & Caruso, 1997) was considered, but excluded due to challenges with administering and scoring the instrument, and the relatively less extensive empirical validation of the instruments.

The Schutte test of emotional intelligence (Schutte et al, 1997) is an omnibus test based on the model of EQ proposed by Salovey & Mayer (1990) and has been subjected to rigorous empirical validation. Baron (1997) developed a measure of EQ that contains fifteen dimensions of EQ and is considered to be one of the more comprehensive measures. The total score is referred to as the global emotional intelligence quotient (EQI). Baron (1997, pg 14) defines emotional intelligence as an "array of non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures." The Baron measure of EQ is comprised of five core elements each with their own sub-dimensions. The five core components are intrapersonal capacities, adaptability, general mood, interpersonal capacities and stress management. The intrapersonal component includes self-regard, emotional self-awareness, assertiveness, independence and self-actualization. The adaptability component includes reality testing, flexibility and problem solving, and the general mood component includes optimism and happiness. The interpersonal component includes empathy, social responsibility and interpersonal relationships, and the stress management component includes stress tolerance and impulse control.

Although only a portion of the content of the Baron measure makes direct reference to the emotional intelligence criteria suggested by Salovey and Mayer (1990, 1997), most of the other content was considered a reasonable proxy for emotional awareness, expression, facilitation and management. For example, the Baron-EQI includes measures of self-regard and assertiveness which do not make direct reference to the criteria suggested by Salovey & Mayer (1990). However, it is reasonable to assume that varying levels of self-regard are a reasonable indication of the extent to which a person is able to identify and manage emotions related to self-evaluation. It is also reasonable to assume that assertiveness is an indication of the ability to identify and manage emotions associated with attempts to influence others in order to satisfying personal needs. For example, lower levels of assertiveness are a reasonable indicator of difficulty identifying and managing emotions like apprehension that often accompanies the process of engaging and attempting to influence others in order to get personal needs satisfied.

Research has shown that current conceptualizations and measurement of EI have a positive impact on individual performance (Kelley & Caplan, 1993), team performance (Bell, 2007; Koman & Wolff, 2008; Landale, 2007) and organizational performance (Langhorn, 2004). Research has also shown a positive impact on employee satisfaction (Law, Wong, Huang & Li, 2008), customer service (Feyerherm & Rice, 2002), customer satisfaction (Kernbach & Schutte, 2005), sales success (Rozell, Pettijohn & Parker, 2008), leadership (Kerr, Garvin, Heaton & Boyle, 2006; Hawkings & Dulewicz, 2007), organizational change (Chrusciel, 2006; Petran, 2008) and conflict management (Suliman & Al-Shaikh, 2007).

Consistent findings of a positive relationship between EQ and elements of the team performance nomological network suggests the emergence of an important variable within the organizational performance nomological network. The emerging status of the construct does not mean that organized and rigorous research efforts should be disregarded, but rather that we should be appropriately cautious about the interpretation of research results while encouraging further experimentation and refinement (Penny, 2010).

The concept of EQ is particularly important because unlike IQ, EQ can change throughout a person's life (Goleman, 1988). This suggests that individuals and the organizations they work for may have access to a manageable psychological state that is antecedent to many other important psychological, behavioral and social states. Given the potential impact of this psychological state, it is important to support the ongoing maturation of the construct.

Cognitive Intelligence

Numerous meta-analyses have confirmed that cognitive intelligence is one of the best predictors of training proficiency and work performance, particularly in complex jobs (Ackerman and Rolfhus 1999; Bertua, Anderson, & Salgado, 2005; Drasgow 2003; Gottfredson 1997; Schmidt 2002). Average correlations typically range between r=0.25 and r=0.60 (Bertua, Anderson and Salgado, 2005). Furnham et al., (2007) suggest that the general correlation between cognitive intelligence and job performance is approximately r=0.35.

Cognitive intelligence is defined as the combination of verbal, numerical and spatial abilities which includes visualizing, use of memory, word fluency, verbal relations, perceptual speed, induction and deduction (Sternberg, 1996). Cognitive abilities are thought to exist in a hierarchy with the highest level referred to as g or general mental ability (GMA). Among all the levels in this hierarchy, general mental ability is thought to be the most powerful predictor of learning and performance in the workplace. Cattel (1971) distinguishes between two types of general mental ability, fluid intelligence (Gf) and crystallized intelligence (Gc). Gf refers to information processing and reasoning ability, and includes inductive, conjunctive and disjunctive reasoning used to understand relations and abstract reasoning (Stankov, 2000). Gc refers to the ability acquire, retain, organize information rather than processing information (Furnham et al., 2007). Furnham et al. (2007) suggest that cognitive intelligence is like a computer with Gf being the information processor (computer chip) and Gc being the information stored in memory (hard drive).

General mental ability (GMA) is measured using either an omnibus test (e.g. Wonderlic Personnel Test, Otis Employment Test) or a battery of tests that target specific cognitive abilities (e.g. General Aptitude Test Battery). Research has shown that general mental ability remains stable over the span of a person's life (Deary, Whalley, Lemmon, Crawford, & Starr, 2000) and has a significant genetic basis (Bouchard, 1998; Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; McGue & Bouchard, 1998). In addition to work performance and training proficiency, research has identified a relationship between GMA and interviewing effectiveness (Fox & Spector, 2000), career success (Bozionelos, 2004, Schmidt & Hunter, 2004) and team performance (Bell, 2007).

Hypotheses

The definition of general intelligence is expanding to include both cognitive and emotional intelligence (Goleman, 1996; Salovey & Mayer, 1990) and recent empirical research suggests that both IQ and EQ are significant predictors of performance across a wide range of performance situations (Bertua, Anderson, & Salgado, 2005). Goleman (1996) suggests that emotional intelligence may be a better predictor of success across a wide range of tasks, and recent research by Advin et al. (2005) and Lam & Kirby (2002) suggests that EQ is a more powerful predictor of performance among banking employees and undergraduate students than IQ, but that IQ still remains a significant predictor.

Research has also identified a moderating relationship where the association between emotional intelligence and performance becomes more positive as cognitive intelligence increases (Cote & Miners, 2006; Ferris, Witt & Hochwarter, 2001). Research by Offerman, Baily, Vasilopoulos, Seal & Vass (2004) showed that cognitive intelligence is a better predictor of performance on individual tasks whereas emotional intelligence is a better predictor of performance on team work. Research by Chang, Sy & Choi (2012) demonstrated significant positive correlations between team performance and both average levels of EQ within the team and team leader EQ. The above research suggests that both IQ and EQ are significant predictors of team and team member performance, but that EQ may be a more powerful predictor of team and team member performance. This highlights the importance of conducting research that reveals the role of EQ within the nomonological network of team and team member performance.

Recent attempts at modeling group emotional competence suggests that efficient and effective management of task and relationship aspects of team work is supported by emotionally competent patterns of interaction between team members (Chang, Sy & Choi, 2012). Emotionally competent patterns of interaction are in turn supported by both the cognitive ability to effectively and efficiently acquire, store and process relevant information, and the ability to identify, describe, facilitate and manage emotions in oneself and others (Koman & Wolff, 2008). The model suggests that both IQ and EQ contribute to emotionally competent patterns of team member interaction which supports team and team member performance both of which help to further develop and reinforce emotional and social competency. This supports the experience of mastery in a team environment and the belief of being in a performance ready state which is a key contributor to efficacy for team work. This group emotional competency approach to modeling team dynamics and performance suggests that both IQ and EQ contributes to efficacy for team work.

H1: Emotional intelligence is positively associated with efficacy for working in teams
H2: Cognitive intelligence is positively associated with efficacy for working in teams.

The social nature of team work suggests that socio-emotional dynamics are inextricably woven into the task execution process and must be appropriately addressed in order to create the potential for superior and sustained team performance. Team members with sufficient IQ, but insufficient EQ may find themselves in a situation where they do not have the emotional competency necessary to take advantage of their cognitive intelligence. Over time this may lead to relative fewer mastery experiences and an erosion of confidence. This situation may be further exacerbated by relatively lower ability to manage the challenging emotional dynamics associated with failure. In this situation a team member who is a cognitive asset may become a team liability as a result of insufficient EQ.

A team member with marginal IQ, but relatively higher EQ, is likely to be considered an asset to the team due to their ability to support constructive and emotionally competent patterns of engagement which in turn helps the team to develop trust and cohesion, which are key contributors to team performance. This will increase the likelihood of mastery experiences and the perception of being in a performance ready state which are key determinants of efficacy for team work. This suggests that EQ may be a more powerful predictor of efficacy for team work than IQ and that the contribution of EQ may be relatively independent of IQ.

H3: Emotional intelligence will be a significantly better predictor of efficacy for working in teams than cognitive intelligence
H4: Emotional intelligence will remain a significant predictor of efficacy for working in teams after controlling for the influence of cognitive intelligence.

Modeling EQ as a completely orthogonal factor to IQ may be somewhat extreme. Cognitive intelligence is manifest in the thinking process, particularly the ability to make and shape constructive mental representations of performance situations, learn from performance and adjust as necessary. Gestalt psychology reminds us that all perception takes place within the context of a personal need system which creates a third dimension within the perceptual process. This third dimension arises out of attending to those aspects of our construction (creates foreground) that we think represent the most significant opportunity and/or threat to meeting our most important current needs. This differentiation (foreground and background) is accompanied by emotions that support various types of responses. This suggests a universal relationship between thought and emotion that is shaped by personal experience over time. For example, fear is generally associated with thinking that you may lose something important whereas sadness is associated with thinking that you have lost something that is important. Personal experiences may require the repression of particular emotions like fear which essentially pushes the associated thoughts out of awareness making more awareness oriented strategies (non-defensive) for managing fear less accessible.

Current brain research suggests that when our mental constructions generate intense emotions, the resulting cortisol release may flood the cortex preventing the cortex from being able to intervene (mindfulness) into the more instinctual protective action patterns governed by the lower brain (Goleman, 1998) This situation is often referred to as becoming emotionally reactive. The ability to identify and appropriately discharge emotion and manage the related thinking process so as to prevent reactivity and preserve the ability to make use of cognitive intelligence is a key emotional competency. This suggests that the relationship between IQ and mastery experiences in team situations may depend on the level of emotional intelligence.
H5: The relationship between cognitive intelligence and efficacy for working in teams will become more positive as emotional intelligence increases

Methodology

Sample and Procedures

The subjects were five hundred and ten business university students enrolled in four university courses. The central feature of the courses was a significant team project which made up forty percent of the final grade. Each person was assigned to a four person team

with the exception of ten teams that had five members. Each team was expected to design and subsequently reengineer a typical workplace process. The teams were expected to capture this process in a handbook and then present their process to class members at the end of the semester. The course created an opportunity for students to experience a short term self managing project team. The context within which the university students worked was considered to be a reasonable approximation of the modern workplace. Each student was responsible for completing individual and team projects across a variety of courses. Each student needed to gather, integrate and update a wide variety of fluid role information. They also needed to continually negotiate with others in order to shape their role requirements and resolve role conflicts.

The subjects completed measures of general efficacy for working in teams, cognitive intelligence and emotional intelligence during the course of the semester. The hypotheses regarding associations between intelligence and efficacy for working in teams were tested using product moment correlations. The Williams T2 test (Williams, 1959) recommended by Steiger (1980) was used to determine whether the association between EQ and efficacy for team work, was significantly greater that the association between IQ and efficacy for working in teams. The Williams T2 test compares whether two dependent correlations that share a common variable are significantly different. Hierarchical regression was used to test whether EQ remained a significant predictor of efficacy for team work after controlling for the influence of IQ. The regression was also used to test whether EQ moderated the relationship between IQ and efficacy for team work. The hierarchical regression was conducted by first regressing IQ on efficacy for team work. In the next step EQ was added to the model and then in the final step the interaction between EQ and IQ was added.

Questionnaires

General efficacy for working in teams was measured using a scale developed by Coetzer and Richmond (2007). Both IQ and EQ were measured using omnibus instruments (Wonderlic and Schutte) and more comprehensive multidimensional instruments (Waston-Glaser and Baron EQI).

Dependent Variable

General efficacy for working in teams. General efficacy for working in teams scale (Coetzer and Richmond, 2007) encompasses general confidence in assisting a team in setting goals, creating a division of labor, developing effective working processes, communicating effectively, resolving conflicts and contributing useful content to the primary task of a team. The measure contains sixteen items and an example item is: I have the ability to work with team members to outline the key tasks required to achieve team goals. Items were measured on a 7-point Likert scale (1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neither agree nor disagree, 5=slightly agree, 6=agree, 7=strongly agree) and the score for each subject was derived by adding up the scores for each of the items.

Independent Variables

Baron Emotional Intelligence Quotient (EQI). Emotional intelligence was measured using the Baron-EQI (Baron, 1997). The Baron-EQI is a comprehensive instrument that measures the fifteen conceptual components of emotional intelligence. The following definitions of each of the fifteen conceptual components was taken from the professional manual accompanying the Baron-EQI measure. Self regard is defined as the ability to respect and accept oneself as basically good, and an example item is: I'm happy with the type of person that I am. Emotional self awareness is defined as the ability to recognize one's feelings, and an example item is: It's hard for me to describe my feelings. Assertiveness is the ability to express feelings, beliefs, and thoughts, and defend one's rights in a non-destructive way. An example item is: It's hard for me to say no when I want to. Independence is the ability to be self-directed and self-controlled in one's thinking and actions, and to be free on emotional dependency. An example item is: I tend to cling to others. Self actualization is the ability to realize one's potential capabilities, and an example item is: I don't have a good idea of what I want to do in life.

Empathy is the ability to be aware of, to understand, and to appreciate the feelings of others, and an example item is: I'm good at understanding the way other people feel. Social responsibility is the ability to demonstrate oneself as a cooperative, contributing, and constructive member of one's social group, and an example item is: It doesn't bother me to take advantage of other people, especially if they deserve it. Interpersonal relationships is the ability to establish and maintain mutually satisfying relationships that are characterized by intimacy and by giving and receiving affection. An example item is: I don't keep in touch with friends.

Reality testing is the ability to assess the correspondence between what is experienced and what objectively exists. An example item is: I tend to exaggerate. Flexibility is the ability to adjust one's emotions, thoughts and behavior to changing situations and conditions, and an example item is: It's easy for me to adjust to new conditions. Problem solving is the ability to identify and define problems as well as to generate and implement potentially effective solutions. An example item is: I generally get stuck when thinking about different ways of solving problems. Stress tolerance is the ability to withstand adverse events and stressful situations without falling apart by actively and positively coping with the stress.

Impulse control is the ability to resist or delay an impulse, drive, or temptation to act, and an example item is: I tend to explode with anger easily. Optimism is the ability to look at the brighter side of life and to maintain a positive attitude even in the face of adversity. An example item is: I generally expect that things will turn out alright, despite setbacks from time to time. Happiness is the ability to feel satisfied with one's life, to enjoy oneself and others, and to have fun. An example item is I'm a fairly cheerful person. The measure contains one hundred and seventeen items that are answered using a five point scale (1=very seldom or not true of me, 2=seldom true of me, 3=sometimes true of me, 4=often true of me, 5=very often true of me or true of me).

Schutte Omnibus Measure of Emotional Intelligence. Schutte et al., (1998) developed an omnibus measure of emotional intelligence comprised of thirty three items. The items in the measure represent the following key components of emotional intelligence proposed by Salovey and Mayer (1990) – appraisal and expression of emotion, regulation of emotion, and utilization of emotion. An example item of appraisal and expression of emotion is: I like to share my emotions with others. An example item of regulation of emotion is: I know when to speak about

my personal problems with others. An example item of utilization of emotions is: When I experience a positive emotion, I know how to make it last. Items were measured on a five point scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) and the score for each subject was derived by adding up the scores for each of the items.

Watson Glaser Critical Thinking Appraisal. The Watson Glaser (Watson & Glaser, 1980) is a test of general mental ability that targets the important abilities involved in critical thinking. The critical thinking appraisal is a paper and pencil test that requires participants to answer a total of eighty questions. The test is comprised of five sections that measure each of the following cognitive abilities – inference, recognition of assumptions, deduction, interpretation and evaluation of arguments. The professional manual accompanying the test provides definitions for each of the cognitive abilities. Inference refers to the ability to discriminate among degrees of truth or falsity of inferences drawn from given data. Recognition of assumptions involves recognizing unstated assumptions or presuppositions in given statements or assertions. Deduction involves determining whether certain conclusions necessarily follow from information in given statements or premises. Interpretation requires weighing and deciding if generalizations or conclusions based on given data are warranted. Evaluation of arguments requires distinguishing between arguments that are strong and relevant and those that are weak and irrelevant to a particular question or issue. The test demonstrates significant correlations with other tests of general mental ability, academic performance (Coate, Lehman, & Stranak 2005) and work performance (Spector, Vance, Schneider, & Hezlett 2000). The test is widely used in industry as a selection tool for predicting success in jobs that require critical thinking.

Wonderlic Personnel Test. The WPT is one of the most widely used short tests of general cognitive ability. It is an omnibus test containing fifty questions that need to be completed in twelve minutes. The test contains a wide variety of question types including – word comparisons, disarranged sentences, sentence parallelism, following directions, number comparisons, number series, analysis of geometric figures and story problems. Test scores on the WPT are highly correlated with traditional tests of intelligence such as the Wechsler Adult Intelligence Scale (Dodrill & Warner, 1998). Research has shown that the WPT predicts success in a wide variety of occupations and tasks (see Wonderlic Personnel Test manual pg 43 for table of research studies).

Results

Means, standard deviations and correlations among the variables appear in table 1. All variable distributions are approximately normal and demonstrate reasonable variation across their respective scales. Cronbach alpha coefficients ranged from α=0.76 to α=0.97 suggesting good internal reliabilities. No univariate or bivariate outliers were considered problematic and the product moment correlations revealed significant associations between the variables.

Table 1

Descriptive Statistics and Correlation Matrix

	Mean	Std Dev	1	2	3	4	5
1. Efficacy for Team Work	89.42	11.86	(0.93)				
2. (IQ) Watson - Glaser	51.77	9.98	0.16**				
3. (IQ) Wonderlic	25.79	5.23	0.12**	0.47**			
4. (EQ) Baron-EQI	401.53	28.64	0.41**	0.02	-0.04	(0.78)	
5. (EQ) Schutte	120.54	10.72	0.44**	-0.04	-0.01	0.48**	(0.80)

Note 1: Cronbach Alpha internal reliabilities are shown in parentheses on the diagonal
*Note 2: **significant at the level $p < 0.01$ (2-tailed)*

All the measures of IQ and EQ were significantly correlated with efficacy for team work but the correlations with the EQ measures were stronger. The correlations between the IQ and EQ measures were all non-significant and close to zero suggesting no association between intellectual and emotional intelligence. The correlations between the EQ measures were significant and strong, as were the correlations between the IQ measures. In general, the results suggest that both IQ and EQ positively influence efficacy for team work, and that EQ has a stronger influence. The results also suggest that IQ and EQ are independent phenomena.

Empirical Tests of Hypotheses

Unless stated otherwise, all hypothesized correlations were in the expected direction, and all reported statistical probabilities are based on two tailed tests (α=0.05).

Hypothesis 1: The correlation between efficacy for working in teams and both the Baron-EQI ($r = 0.41$, $p < 0.01$) and the Schutte ($r = 0.44$, $p < 0.01$) were statistically significant and represent a medium to strong association (Cohen, 1988). This provides support for the hypothesis that emotional intelligence has a medium to strong influence on efficacy for working in teams. More specifically, this suggests that the ability to identify, manage and make productive use of emotions supports the ability to better manage the emotional aspects of team work which increases the likelihood of productive team experiences. More productive team experiences should reinforce confidence for working in teams.

Hypothesis 2: The correlation between general efficacy for working in teams and both the Wonderlic ($r = 0.12$, $p < 0.01$) and the Watson-Glaser ($r = 0.16$, $p < 0.01$) were statistically significant and represent a small to medium association (Cohen, 1988). This provides support for the hypothesis that cognitive intelligence has a small to medium influence on efficacy for team work. More specifically, this suggests that the ability to manage the intellectual components of team work supports team member effectiveness which in turn reinforces confidence for working in teams.

Hypothesis 3: The difference between the correlation of efficacy for team work with emotional intelligence (average $r = 0.42$), and efficacy for team work with cognitive intelligence (average $r = 0.14$) is statistically significant (Williams T2 test: $p < 0.01$). This provides support for the hypothesis that emotional intelligence is a significantly better

predictor of efficacy for team work than cognitive intelligence. More specifically, this suggests that the ability to manage the emotional dynamics of team work may be more influential in determining team member effectiveness than managing the intellectual requirements. This in turn should lead to EQ making a relatively more significant contribution to efficacy for team work.

Hypothesis 4. Inclusion of the Schutte Omnibus EQ measure within a regression model already containing the Wonderlic measure produced a significant beta coefficient for the Schutte Omnibus EQ measure (β= 0.43, p<0.00) and a significant r-square change (p<0.00) for the model. Inclusion of the Schutte Omnibus EQ measure within a regression model already containing the Watson-Glaser measure produced a significant beta coefficient for the Schutte Omnibus EQ measure (β= 0.41, p<0.00) and significant r-square change (p<0.00) for the model. Inclusion of the Baron-EQI measure within a regression model already containing the Wonderlic measure produced a significant beta coefficient for the Baron-EQI measure (β= 0.40, p<0.00) and significant r-square change (p<0.00) for the model. Inclusion of the Baron-EQI measure within a regression model already containing the Watson Glaser Measure produced a significant beta coefficient for the Baron-EQI measure (β= 0.38, p<0.00) and a significant r-square change (p<0.00) for the model. The inclusion of the EQ variables into models already containing either of the IQ variables consistently produced significant beta coefficients for the EQ variables and significant r-square change for the models that included either of the EQ variables. This provides support for the hypothesis that emotional intelligence remains a significant predictor of efficacy for team work after controlling for the influence of cognitive intelligence. More specifically, this suggests that the impact of EQ on efficacy for team work is independent of IQ.

Hypothesis 5. The beta coefficients for all interaction variables generated from possible combinations of the IQ variables with the EQ variables were non-significant when entered into regression models already containing the associated IQ and EQ variables (see table 2).

Table 2

Statistical Significance of Interaction Terms

Interaction Term	Beta Coefficient	Significance
Wonderlic x Schutte	0.01	0.92
Wonderlic x Baron	-0.05	0.40
Watson-Glaser x Schutte	0.03	0.42
Watson-Glaser x Baron	0.06	0.88

The hypothesis that EQ moderates the relationship between IQ and efficacy for team work is consistently not supported. This suggests that the relationship between IQ and efficacy for team work does not depend on the level of EQ possessed by team members. Intellectual intelligence makes a small to medium level contribution to a team member's confidence regardless of the level of emotional intelligence possessed by the team member.

Conclusions and Discussion

Both IQ and EQ are significant predictors of efficacy for working in teams, but EQ is a significantly stronger predictor. This suggests that both IQ and EQ support team member

confidence but that EQ makes a much bigger contribution to a team member feeling confident about working in teams. The relationship between EQ and efficacy for working in teams remains significant even after controlling for the influence of IQ. This suggests that EQ has a separate, distinct and significant impact on team member confidence. The relationship between IQ and efficacy for team work is not moderated by EQ suggesting that the contribution of IQ to team member confidence does not depend on how emotionally intelligent the team member is. Overall, these results suggest that EQ is an important requirement for developing confidence in one's ability to work effectively in teams and is an important variable within the team performance nomological network.

Implications for the Workplace and Education Institutions

Organizational leaders that are increasingly reliant on the performance of employee teams need to be aware of the influence of IQ and EQ on team member confidence. Selecting team members who possess the necessary IQ required to perform team tasks successfully is important. However, IQ alone is not a strong predictor of confidence in one's ability to work in teams. Ensuring the team members have the necessary levels of EQ is significantly more important for promoting confidence. This is an important outcome from a practitioners' perspective given the potential of being able to change emotional intelligence. Individual training and team interventions that target and promote higher levels of emotional intelligence may have a significant impact on individual and team performance in organizations.

Education processes like management programs within universities, need to assist potential managers in identifying and developing their own levels of emotional intelligence. The use of student teams are potentially a powerful vehicle for developing emotional intelligence given that such intelligence is shaped by social dynamics. It is important that student teams be provided with the assistance required to promote higher levels of emotional intelligence given the formative influence of these team experiences. Colleges of business may need to increase the level of support provided to student teams in order to ensure that the educational outcomes hoped for are in fact achieved.

Limitations and Suggestions for Future Research

Although the working conditions for subjects in this study were a reasonable approximation of self-managing teams in the modern workplace, future studies are needed to sample a variety of work teams and situations. Developing and testing models that encompass the network of relationships between IQ, EQ, efficacy, and performance will help to provide a more integrated and clear map of this nomological network. More research on the antecedents of EQ is needed in order to identify powerful and available causes that can then be focus of effective training and interventions. Further work is required to stabilize and clarify the construct boundaries of EQ. The goal of this research is to add to the understanding of the relationship between IQ, EQ and team work.

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