# Does Emotional Intelligence – as Measured by the EQI – Influence Transformational Leadership And/or Desirable Outcomes?

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# Does emotional intelligence – as measured by the EQI – influence transformational leadership and/or desirable outcomes?

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**Abstract**

**Purpose** – This study aims to examine the possibility of relationships between and among emotional intelligence (EI), leadership, and desirable outcomes in organizations.

**Design/methodology/approach** – Using a sample of 2,411 manufacturing workers, engineers, and professional staff, the study empirically examined the impact of EI, as measured by Bar-On's Emotional Quotient Inventory (EQI), on organizational outcomes; the well documented ability of transformational leadership to predict those outcomes, and the relationship between EI and transformational leadership.

**Findings** – The results confirm previous studies of the extraordinary effectiveness power of transformational leadership in predicting organizational outcomes. However, in this study no support was found for hypothesized relationships between EI and desirable outcomes or a significant relationship between EI and transformational leadership.

**Originality/value** – EI may be a useful concept in understanding leadership and social influence; however, unlike previous studies no indication was found that EI as operationalized and measured by the EQI is of particular value in that exploration.

**Keywords** Emotional intelligence, Transformational leadership, Comparative tests, Organizational performance

**Paper type** Research paper

Ultimately, the study of leadership is about understanding and improving how leaders can help their followers to achieve desired outcomes. Emerging concepts of emotional intelligence (EI) have shown some promise in regard to illuminating the relationship between dispositional characteristics, leadership, and outcomes (Bono and Judge, 2004; Cherniss, 2000). While the connection between transformational leadership (TL) and desirable outcomes (DO) is well established (Lowe *et al.*, 1996), how EI might best be theoretically included in the relationship between leadership and outcomes is still under investigation. This is an empirical study, using a large and robust sample that examines a number of possible relationships between EI, as measured by a venerable and widely used measure, Bar-On's (1996) Emotional Quotient Inventory (EQI), TL and DO.

## Literature review and theoretical development

### *TL*

Efforts to understand social influence and leadership have paralleled most of human history; however, the application of scientific approaches to the development of knowledge about leadership is largely a twentieth century phenomenon (Bass, 1990;

Bryman, 1996). The notion that an individual's personal or physical traits might explain or predict leadership capacity continued to have currency well into the twentieth century (Zaccaro *et al.*, 2004). Having misinterpreted the role of traits in leadership and previously lacking the statistical tools to integrate independent correlation coefficients, trait theory was largely cast aside in the mid-twentieth century (Zaccaro *et al.*, 2004; Bass, 1990) in favor of behavioral and contingency approaches. A focus on what behaviors leaders actually engaged in dominated leadership research and accounted for significant advances in the understanding of social influence and leadership through the middle to late 1900s (Bass, 1990; Yukl, 1989, 1998). These research-based advances slowed considerably by the 1970s with the field falling into a protracted malaise (Hunt, 1999), only to be rescued and reinvigorated by the charismatic and TL initially suggested by Burns (1978) and operationalized by Bass and his colleagues (Bass, 1985a, b; Bass *et al.*, 1987).

Guided by theory, the understanding of TL has been, like almost all leadership research, focused on leader-follower interactions. Attention to TL has dominated the scientific approaches to the understanding of leadership for almost two decades (Hunt, 1999). While studies of the leader-follower interaction utilizing the Multifactorial Leadership Questionnaire (MLQ) have been enormously fruitful, substantial amounts of variation in that interaction remain to be explained (Lowe *et al.*, 1996; Bass and Avolio, 1996).

As the interest in charismatic and TL approaches has developed and matured, various calls have been heard for more holistic approaches to the consideration of leadership capacity and the leadership process (Yukl, 1999; Conger, 1999; Mumford *et al.*, 2000; Rafferty and Griffith, 2004). One possibility is to look at leadership not just as interaction, but rather as a function of a skill set possessed and deployed by the individual leader. If we frame our understanding of leadership by concentrating on not just what leaders do, but rather by a consideration as to what capabilities an individual must have in order to perform effectively in a leadership role, perhaps understanding, selection and development could be enhanced. An interest in the dispositional characteristics of leaders and how that might impact TL has been speculated upon, and occasionally investigated (e.g. Atwater and Yammarino, 1992, 1993; Bono and Judge, 2004; Ross and Offermann, 1997; Sosik and Mergerian, 1999):

*H1.* TL positively predicts DO.

*Rationale*. The first hypothesis serves as a base line from which to examine the impact of adding the EI construct to the leadership model. The relationship between transformation leadership and DO is well established and there should be no reason to suspect that this sample will yield different results. In fact, should this relationship not hold, it would be a good reason to suspect some problem with representativeness or methodology.

Once the baseline relationship between TL and DO have been established, it is appropriate to examine how EI might enhance our understanding. There are basically three ways in which EI could enhance our understanding of the leadership process:

(1) EI could be an independent factor that explains additional variance;

(2) EI could be causally prior to TL; or

(3) could moderate the TL-DO relationship.

This study uses a large, real-world sample from a manufacturing plant to assess these possibilities. To begin, we examine the construct of EI.

*EI*

Although the existence and importance of intelligences beyond memory and problem solving had long been recognized, it was not until relatively recently that serious efforts were made to define EI (Salovey and Mayer, 1990; Goleman, 1995), or that considerable popular attention was paid to the concept (Goleman, 1995). Over the last decade considerable attention has been paid to the issues of definition, independence, measurement and impact on organizational outcomes (Goleman, 1995, 1998; Cherniss, 2000, Cooper and Sawaf, 1997; Mayer and Salovey, 1997; Mayer *et al.*, 2000; Ryback, 1997; Weisinger, 1998). With resolution of important definitional, psychometric and causal inference issues in process, the objective of this study is to investigate the possible relationship between EI, TL and DO, and to add to a small body of empirical studies examining whether or not EI concepts might in some way contribute to the understanding of social influence, as embodied in the concepts of TL.

The relationship between traditional measures of cognitive intelligence and leadership has been the object of considerable examination. In a meta-analysis of all studies of the intelligence-leadership relationship published from 1887-2002, Judge *et al.* (2004) concluded that the correlation between intelligence and leadership was 0.27 (corrected for range restriction) with a standard deviation of 0.17. While of substantial practical importance (Schmidt and Hunter, 1981), the relationship between intelligence and leadership is nevertheless relatively modest (Judge *et al.*, 2004, 2002). The possibility of other forms of intelligence beyond memory and problem solving has been the object of long-term speculation (Thorndike and Stein, 1937; Piaget, 1981; Wechsler, 1940). While Salovey and Mayer (1990) provided the first modern definition of EI, it was the publication of the best-selling book, *Emotional Intelligence* (Goleman, 1995), which coalesced previously nascent attention of management researchers regarding the concept of an EI.

Over the last decade two distinctly different, but related, models of EI have been suggested (Ciarrochi *et al.* 2001). The first of these models is an "ability" model, which combines emotion with intelligence, and the second is a "mixed model", which combines traits with social behaviors and competencies. The ability model has largely evolved from Salovey and Mayer's (1990) original definition of EI, and has attracted considerable research attention (Mayer *et al.*, 1999, 1990; Mayer and Salovey, 1993, 1997; Salovey and Mayer, 1990). Salovey and Mayer originally defined EI as the ability to deal with one's own emotions and those of others to advantage in problem solving and decision making. The mixed model arises largely from the work of Bar-On (1997), an approach generally embraced and advocated by Goleman (1995, 1998). Bar-On (2000) concludes that emotional and social intelligence is a "multifactorial array of interrelated emotional, personal, and social abilities that influence our overall ability to actively and effectively cope with daily demands and pressures". This study utilizes Bar-On's EQI to measure EI, and is operationalized by that instrument, as is more completely described in a following section.

A robust debate regarding the appropriateness and efficacy of the two models has been fully joined in the academic literature (e.g. Emmerling and Goleman, 2003). Advocates of the ability model argue that their models and measurement instruments

are scientifically derived and psychometrically independent from other measures of personality, (Mayer *et al.*, 1999, 1990; Mayer and Salovey, 1993, 1997; Salovey and Mayer, 1990). Advocates of the mixed model argue that their approach is highly correlated with desired organizational outcomes and of great value to organizational and leadership development (Emmerling and Goleman, 2003, Goleman, 1995, 1998; Goleman *et al.*, 2002). Advocacy for and well-done studies of both the ability and mixed models appear equally persuasive; however, thus far the evidence for one approach does not seem conclusively superior to the other.

Several studies have found relationships between EI and outcome variables of interest to managers. In their seminal studies Wong and Law (2002) and Law *et al.* (2004) derived their own theoretically based measures of EI and demonstrated that the measures had favorable psychometric properties. They then used the measures to predict managerial outcomes and found that they explained unique variance after controlling for widely accepted personality variables. Wolf *et al.* (2002) used EI to explore the emergence of leaders within self-managed teams and found that empathy was related to selection for leadership positions.

Accordingly, it could be argued that EI might best be described as an independent factor that would explain significant variance in DO. In this case, we would see results where the EQI measure correlated directly with DO. Further, the strength of that relationship would not be diminished by adding TL to the prediction equation. Theoretically this means that EI is independent of TL, and explains some of the variance in DO that cannot be explained by TL. This leads to *H2*:

*H2.* Leader EI is positively related to DO, either independently or after controlling for the effects of TL.

*Rationale*. This hypothesis examines the direct effects of the EI construct as an outcome predictor. More emotionally intelligent leaders might produce more DO, once the variance explained by their choice of leadership styles is removed, because EI may explain additional variance in an additive manner. The EQI is the oldest and most widely used measure of EI. Previous studies have shown direct effects of EI, as measured by the EQI, on outcome measures (Barling *et al.*, 2000; Sivanathan and Fekken, 2002; Mandell and Pherwani, 2003). EI might show direct relationships with the outcome measures or explain residual variance in those measures after controlling for the effects of TL.

### *EI and TL*

More interesting than exploring just the direct effects of EI on the outcome variables is the examination of how EI might interact with the well known and empirically reliable TL model. Various claims, both theoretical and empirical, have been made regarding a relationship between EI, leadership, and DO.

## Theoretical perspectives

Goleman *et al.* (2002) have suggested that EI has an important impact on team leadership. Prati *et al.* (2003) makes an even more comprehensive case for a positive relationship between EI and leadership, a perspective which has attracted equal amounts of attention and sharp criticism on theory development and interpretation of previous research (Antonakis, 2003).

Sosik and Mergerian (1999) suggested four intersections between EI and TL:

(1) Adherence to professional standards of behavior and interaction which they related to idealized influence or charisma.

(2) Motivation which is related to the inspirational motivation component of TL. Sosik and Mergerian opine that emotionally intelligent leaders feel more secure in their ability to control and influence life events.

(3) Intellectual stimulation.

(4) Individual focus on others which is related to individualized attention.

Sosik and Mergerian (1999) suggest that the above aspects are necessary to establish and manage strong emotional relationships with followers. These ideas are very similar to the descriptions of various aspects of TL, particularly idealized influence.

The notion that strong EI is associated with leadership performance is a recurring theme in the work of Goleman (1995,1998). In fact, Goleman's (1998) ambitious contention that EI is at least twice as important to organizational outcomes as cognitive intelligence or technical skill has attracted considerable, albeit empirically unsupported, attention (Cherniss, 2000).

Lewis (2000) argues that positive affect and enthusiasm are necessary to elevate the emotional state of followers. The notion of emotional contagion is often associated with the idealized influence and inspirational motivation aspects of TL. Similarly, Riggio (1986, 1987, 1998) defines charisma in terms of well-developed social and emotional skills which are often associated with charisma (idealized influence is a key element of TL, often explaining most of the variance). George (2000) identified management of emotions, both those of the leader and those of followers, as being critical to leadership. She points to the use of emotional appeals, as aspect of inspirational motivation, as characteristic of both emotionally intelligent individuals and transformational leaders.

As previously noted the advocacy for EI is not without its detractors. Just as various concepts of EI seem to be gaining momentum, significant cautions and objections have been raised in regard to epistemological and theory developmental issues. Zaccaro and Horn (2003) feel that an absence of a systematic and comprehensive conceptual framework between EI leadership, along with a rush to judgment over an intuitively appealing concept, threatens to give EI more of the characteristics of a "management fad" than a grounded theory. Antonakis (2003) cites alternate explanations for results and the quality of supporting empirical evidence of a relationship between EI and leadership and describes the excitement regarding EI as "premature". Having conducted review of the basic assumptions of EI research Matthews *et al.* (2002) conclude that the concept is currently more "myth than science," while opining that myths can often stimulate scientific research.

## Empirical evidence

In addition to the above-mentioned theoretical discussions, there are several empirical studies which have demonstrated that self awareness, an element of EI measured by agreement between self and other ratings of TL behaviors, is positively related to performance (Atwater and Yammarino, 1992, 1993; Sosik and Dworakivsky, 1998; Moshavi *et al.*, 2003). The basic theory underlying these efforts echos the above arguments and suggests that a leader who is sensitive to emotional dimensions in

interactions, including both his/her own emotional state and/or the emotional state of the followers, might be better able to function.

Further, direct investigations of the links between EI and TL are starting to appear in the literature. Mandell and Pherwani (2003) found a significant predictive relationship between EI and TL behaviors, as well as a significant difference between the EI scores of the men and women in their study. In an empirical study involving 49 managers, Barling *et al.* (2000) found a significant relationship between EI and three of the four behavioral elements of TL. Sivanathan and Fekken (2002) found a significant correlation between EI and TL among 12 university residence hall staff supervisors.

Duckett and Macfarlane (2003) examined EI and TL relationships in the managers of 21 retail stores in the UK, and found a "strong" relationship. In a study of 43 former students, most of whom held management positions, Palmer *et al.* (2001) found significant correlations between a measure of EI and several components of TL. Utilizing their own measure of EI, Gardner and Stough (2002) found correlations with all elements of TL.

Thus, it might be argued that inspiration, charismatic leadership, motivation and to a lesser extent, idealized influence are at least partially affective in origin, and that a leader who was emotionally aware might be better able to understand and thus influence their followers. The influence of EI on leadership performance might be particularly marked in the case of TL, where several of the key leadership behaviors make reference to the affective state of the followers.

While a positive relationship between TL and organizational outcomes is well established (Lowe *et al.*, 1996; Avolio and Bass, 1997), thus far support for a predictive relationship between EI and organizational outcomes has been generally more intuitive and rhetorical than empirical (Ashkanasy and Daus, 2002; Lam and Kirby, 2002; Humphries *et al.*, 2003). Several of the more active researchers in the field have advanced the argument that rather than being a unique predictor of organizational outcomes, EI is a building block for emotional competence, which combines or interacts with other factors leading to performance (Goleman, 1998; Mayer *et al.*, 2000; Gowing, 2001). Our study seeks to illuminate further, utilizing a relatively large group of managers and followers, the possible relationships between and among EI, TL, and performance.

Theoretically, there are two ways in which EI could contribute to our understanding of the relationship between TL and DO. The first possibility is that EI could be causally prior to TL. This would mean that a higher EI leader would be more likely to use TL, as opposed to contingent reward and *laissez-faire*, because their greater EI allows them superior understanding of what will motivate their followers. Accordingly, this hypothesis would be stated as:

*H3.* EQI will be positively related to transformational and negatively related to contingent reward and *laissez-faire* leadership styles.

*Rationale*

One effect of higher leader EI might be in the choice of the leadership style that a leader uses. High EI leaders might be more likely to use styles that would effectively make use of the leaders' superior understanding of their emotional states and those of their followers. TL is more affectively based than the other leadership styles, and high EI leaders might be more likely to choose this style.

Alternatively, EI could moderate the TL-DO relationship. This would mean that the effectiveness with which transactional leadership is used depends in part on the EI of the leader. There are several ways in which this could happen. If EI explains unique variance in outcome prediction equations, but the interaction term is not significant, which would support *H2*, it would suggest that EI may be a factor independent of TL, which can explain additional variance in the dependent outcome variables. Here we would say that EI enhances our ability to predict.

A second possibility is that EI might moderate the relationship between transactional leadership and desired outcomes. Here we would expect to see a significant interaction term between TL and EQ when predicting DO in a hierarchical regression analysis. A positive coefficient for the interaction term would suggest that TL and EQ are synergistically effective, in that leaders who are above average in both are superior producers of outcomes than we would expect on the basis of the additive model. A negative coefficient for the interaction term would suggest that TL and EQ are substitutable to some extent. Leaders who are high on either one, but not necessarily on both, produce the desired outcomes. This leads to the following hypothesis:

*H4.* Adding EI to a predictive model where TL is used to predict DO will produce a significant interaction effect.

### *Rationale*

Leader EI might very well moderate the TL/DO relationship. In this case, the TL $\times$ EI interaction may be significant, indicating either a complementary (as indicated by a negative coefficient) or synergistic (as indicated by a positive coefficient) effect for TL and EI.

## Methods

This study was conducted in a large US manufacturing facility, which is a part of an international technology company. Anticipating a leadership development program, management sought assistance from the first author to ascertain the current status of leadership capacity and employee attitudes regarding leadership issues as an initial step in that process.

### *Leadership measures*

The MLQ was developed by Bass and Avolio (1996) and has been shown to be a reliable instrument that has validity in the measurement of TL and other elements of a full range of leadership model (Antonakis *et al.*, 2003; Tepper and Percy, 1994). A few of the 45 items in the rater and self versions of MLQ-Form 5x (Bass and Avolio, 1996) were very slightly modified (e.g. "the person I am rating" was changed to read, "my supervisor") to make the verbiage appropriate for the particular situation and terminology of the plant. The scales of interest in this study are the four subscales of TL (individual attention, intellectual stimulation, inspirational motivation, and idealized influence) each measured by four individual items. A single measure of TL was computed by aggregating those four subscale measures. This provided an overall assessment of TL for each of the managers and supervisors at the facility.

*EI measure*

Each of the focal leaders completed Bar-On's (1996) EQI. The EQI contains 133 items, which produce an overall EQI score, five scales and 15 subscales. The five scales are "Intrapersonal," "Interpersonal," "Adaptability," "Stress management," and "General mood." High scores on the Intrapersonal scale indicate an individual who is in touch with his/her feelings and has positive feelings about him/herself and his/her life (Bar-On, 1996). High scores on the Interpersonal scale indicate good interpersonal skills (Bar-On, 1996). High scores on the Adaptability scale indicate an ability to cope with environmental demands and pressures (Bar-On, 1996). High scores on Stress management indicate an ability to handle stress, and General mood indicates the ability to enjoy life (Bar-On, 1996). The EQI has been extensively examined and shown to have reasonable levels of reliability, validity, and psychometric independence (Bar-On, 1996; Dawda and Hart, 2000).

*Outcome measures and dependent variables*

Perceptions of unit effectiveness, satisfaction with supervision, and willingness to expend extra effort were collected, utilizing items that are included in the MLQ. Job satisfaction and supervisor satisfaction were measured utilizing scales developed by Hackman and Oldham (1980), as was a measure of internal turnover intent, referred to elsewhere in this study as the "non-MLQ" dependent variables. The latter was a three-item measure of intention to request transfer to another work unit. Overall turnover at the plant was very low, probably as a function of local economic conditions and the relative wages paid at the plant, and any measure of turnover intent was likely to be restricted in range and resistant to analysis. A measure of internal turnover, expressed as a desire or intention to ask for a transfer to another work unit, was considered a more meaningful measure of employee reaction to the work situation.

*Sample and survey administration*

All hourly employees present for work were required to appear at one of several meetings conducted during work hours during each of the three shifts over a four-day period. At the beginning of each meeting the general manager of the facility made a short presentation representing the purpose of the survey to be an effort to better understand how employees felt about the leadership they received, and encouraged frank and honest responses to all questions. The first author followed with a short presentation assuring respondents of anonymity prior to completing the survey. Following these comments, all attendees completed the "Rater" version of the MLQ and a short questionnaire soliciting their attitudes regarding the non-MLQ dependent variables described in the previous section. During the same four day period similar meetings were held for managers, supervisors and members of the professional staff. During these meetings all attendees also completed the "Rater" version of the MLQ and the questionnaire containing the items which constituted the non-MLQ dependent variables. At the latter meetings all managers and supervisors with direct reports also completed the EQI.

A total of 2,425 questionnaires were completed, of which 2,411 were usable for the purposes of the study. Usable self- reports and a minimum of three usable follower reports were available for 161 managers and supervisors who had also completed the EQI. The follower assessments of leadership behaviors of managers and supervisors

represented the aggregated sentiment of 2,411 followers. Manager/supervisors in the study had an average of 178.18 months of longevity in the company, 28 percent identified themselves as female, 72 percent as male.

## Results

### *Level of analysis*

Since the TL data and the outcome measures were collected at the individual level, while the EQI measure was collected at the group level (i.e. for each group leader), it is impossible to perform a traditional WABA analysis (Dansereau *et al.*, 1984). It is important to examine the degree to which it is appropriate to consider the data for group level analysis. Accordingly, the TL and desired outcome measures were examined using the Interclass correlation coefficient approach (Bartko, 1976; Bliese, 2000; Castro, 2002; McGraw and Wong, 1996). In ICC, analysis estimates are made of the amount of variance that is explainable at the group level, ICC(1) and the degree to which the group members agree about their perceptions, ICC(2). In the current study, these were estimated using the Bliese and Halverson (1996) formula because group sizes were unequal (see Tables I and II). Based on the usual criteria (ICC(1) $> 0.05$, indicating at least 5 percent of total variance explainable at the group level and ICC(2) $> 0.7$, indicating substantial levels of within-group agreement about the ratings, the decision was made to continue the analysis with all the leadership measures, all the EQI scales and four dependent variables: extra effort, leader effectiveness and two measures of leadership satisfaction. Job satisfaction, turnover and transfer intent were eliminated from further analysis on the grounds that they had inadequate group variance and lower-than-acceptable levels of agreement across group members.

### H1

*H1* predicted that TL would be positively associated with DO. We tested *H1* using a series of multiple regressions that regressed the TL scale and subscales on each dependent variable (see Table III). The overall TL variable predicted a significant amount of variance in all of the outcome variables (extra effort, leader effectiveness, satisfaction with leader, and supervisor satisfaction). The models all predicted a significant amount of variance in the dependent variables, and $R^2$ ranged from 0.32 to 0.86, $p < 0.001$. Most of the TL subscales predicted a significant amount of variance in the DO. All of the regression models predicted a significant amount of variance in the dependent variables, and $R^2$ ranged from 0.37 to 0.87, $p < 0.001$. None of the other TL subscale coefficients predicted significant variance in supervisor satisfaction. Consistent with past research, our results provide substantial support for the relationship between TL and DO.

### H2

*H2* predicted that higher levels of EI would be positively associated with DO. We tested *H2* using a series of multiple regressions that regressed each EI scale and subscale on each dependent variable (see Table IV). Neither the overall EQI EI scale nor the subscales predicted a significant amount of variance in any of the dependent variables. Interestingly, only one of the coefficients (Adaptability, $\beta = 0.60$, $p < 0.10$) even approached predicting a significant amount of variance in a dependent variable

**Table I.** Descriptive statistics and correlations for study variables

| | | M | SD | ICC(1) | ICC(2) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | EQI | 100.75 | 13.61 | | | 1 | | | | | | |
| 2. | Intrapersonal | 100.77 | 14.43 | | | 0.85** | 1 | | | | | |
| 3. | Interpersonal | 98.02 | 13.89 | | | 0.72** | 0.62** | 1 | | | | |
| 4. | Adaptability | 102.00 | 12.65 | | | 0.82** | 0.71** | 0.56** | 1 | | | |
| 5. | Stress | 101.95 | 12.00 | | | 0.69** | 0.53** | 0.39** | 0.66** | 1 | | |
| 6. | Mood | 100.30 | 12.86 | | | 0.82** | 0.77** | 0.68** | 0.64** | 0.55** | 1 | |
| 7. | Transformational leadership | 2.42 | 0.58 | 0.21 | 0.79 | 0.06 | 0.06 | 0.06 | 0.08 | −0.003 | 0.04 | 1 |
| 8. | Individual consideration | 2.29 | 0.65 | 0.17 | 0.74 | 0.02 | 0.02 | 0.05 | 0.04 | −0.04 | 0.01 | 0.96** |
| 9. | Intellectual stimulation | 2.34 | 0.60 | 0.19 | 0.78 | 0.04 | 0.06 | 0.01 | 0.07 | −0.002 | 0.02 | 0.96** |
| 10. | Inspirational motivation | 2.58 | 0.59 | 0.20 | 0.78 | 0.09 | 0.09 | 0.08 | 0.08 | 0.01 | 0.07 | 0.94** |
| 11. | Idealized influence | 2.46 | 0.59 | 0.18 | 0.76 | 0.09 | 0.08 | 0.08 | 0.10 | 0.03 | 0.06 | 0.98** |
| 12. | Contingent reward | 2.42 | 0.63 | 0.15 | 0.73 | 0.02 | 0.02 | 0.02 | 0.04 | −0.06 | 0.03 | 0.91** |
| 13. | *Laissez-faire* | 0.99 | 0.54 | 0.16 | 0.74 | 0.03 | 0.000 | −0.02 | 0.03 | 0.09 | 0.03 | −0.76** |
| 14. | Extra effort | 2.39 | 0.66 | 0.17 | 0.75 | 0.03 | 0.02 | 0.07 | 0.05 | −0.01 | 0.01 | 0.93** |
| 15. | Leader effectiveness | 2.71 | 0.64 | 0.19 | 0.78 | −0.02 | −0.01 | −0.02 | 0.001 | −0.07 | −0.01 | 0.93** |
| 16. | Leader satisfaction | 2.62 | 0.75 | 0.20 | 0.79 | −0.03 | −0.04 | −0.01 | −0.01 | −0.04 | −0.01 | 0.91** |
| 17. | Supervisor satisfaction | 4.77 | 1.08 | 0.15 | 0.69 | −0.03 | 0.02 | 0.04 | −0.11 | −0.02 | 0.03 | 0.57** |
| 18. | Job satisfaction | 5.46 | 0.69 | 0.05 | 0.41 | 0.03 | 0.002 | 0.10 | −0.03 | −0.01 | 0.02 | 0.19 |
| 19. | Turnover | 2.51 | 1.00 | 0.04 | 0.36 | −0.11 | 0.03 | −0.22* | −0.04 | −0.18 | −0.10 | 0.11 |
| 20. | Transfer intent | 3.40 | 0.76 | 0.06 | 0.46 | 0.06 | 0.13 | −0.04 | 0.14 | 0.01 | −0.03 | −0.02 |

**Notes:** $n$ ranges from 95 to 529; * $p < 0.001$; ** $p < 0.001$

**Table II.** Descriptive statistics and correlations for study variables

| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. EQI | | | | | | | | | | | | |
| 2. Intrapersonal | | | | | | | | | | | | |
| 3. Interpersonal | | | | | | | | | | | | |
| 4. Adaptability | | | | | | | | | | | | |
| 5. Stress | | | | | | | | | | | | |
| 6. Mood | | | | | | | | | | | | |
| 7. Transformational leadership | | | | | | | | | | | | |
| 8. Individual consideration | 1 | | | | | | | | | | | |
| 9. Intellectual stimulation | 0.92*** | 1 | | | | | | | | | | |
| 10. Inspirational motivation | 0.83*** | 0.86*** | 1 | | | | | | | | | |
| 11. Idealized influence | 0.92*** | 0.91*** | 0.92*** | 1 | | | | | | | | |
| 12. Contingent reward | 0.88*** | 0.85*** | 0.86*** | 0.91*** | 1 | | | | | | | |
| 13. *Laissez-faire* | −0.74*** | −0.73*** | −0.71*** | −0.75*** | −0.68*** | 1 | | | | | | |
| 14. Extra effort | 0.88*** | 0.90*** | 0.86*** | 0.91*** | 0.85*** | −0.71*** | 1 | | | | | |
| 15. Leader effectiveness | 0.90*** | 0.09*** | 0.87*** | 0.92*** | 0.89*** | −0.81*** | 0.90*** | 1 | | | | |
| 16. Leader satisfaction | 0.89*** | 0.88*** | 0.84*** | 0.89*** | 0.85*** | −0.79*** | 0.89*** | 0.93*** | 1 | | | |
| 17. Supervisor satisfaction | 0.59*** | 0.59*** | 0.48*** | 0.53*** | 0.51*** | −0.51*** | 0.56*** | 0.55*** | 0.59*** | 1 | | |
| 18. Job satisfaction | 0.24* | 0.20* | 0.11 | 0.16 | 0.13 | −0.19 | 0.13 | 0.15 | 0.15 | 0.31* | 1 | |
| 19. Turnover | 0.10 | 0.11 | 0.12 | 0.11 | 0.11 | −0.23* | 0.14 | 0.14 | 0.15 | 0.02 | −0.56*** | 1 |
| 20. Transfer intent | −0.09 | −0.03 | 0.02 | 0.03 | −0.01 | 0.10 | 0.01 | 0.01 | −0.02 | −0.31** | −0.41** | 0.28** |

**Notes:** $n$ ranges from 95 to 529; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

| | Extra effort | Effectiveness | Leader satisfaction | Supervisor satisfaction |
|---|---|---|---|---|
| Transformational leadership | 0.93*** | 0.93*** | 0.91*** | 0.57*** |
| $R^2$ | 0.86 | 0.87 | 0.83 | 0.32 |
| $F$ | 991.52**** | 1087.46*** | 831.58**** | 44.32*** |
| df | 1, 166 | 1, 166 | 1, 166 | 1, 93 |
| Individual consideration | 0.09 | 0.30*** | 0.37*** | 0.42 |
| Intellectual stimulation | 0.33*** | 0.12 | 0.25** | 0.38 |
| Inspirational motivation | 0.08 | 0.16* | 0.15* | −0.19 |
| Idealized influence | 0.46*** | 0.38*** | 0.20* | −0.04 |
| $R^2$ | 0.86 | 0.87 | 0.83 | 0.37 |
| $F$ | 254.94*** | 267.58**** | 204.88*** | 13.14*** |
| df | 4, 163 | 4, 163 | 4, 163 | 4, 90 |

**Notes:** Standardized regression coefficients are reported; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.001$

**Table III.** Regression of transformational leadership and subscales on desirable outcomes

| | Extra effort | Effectiveness | Leader satisfaction | Supervisor satisfaction |
|---|---|---|---|---|
| Emotional intelligence (EQI) | 0.03 | −0.02 | −0.03 | −0.03 |
| $R^2$ | 0.001 | 0.001 | 0.001 | 0.001 |
| $F$ | 0.17 | 0.09 | 0.12 | 0.07 |
| df | 1, 159 | 1, 159 | 1, 159 | 1, 103 |
| Intrapersonal | −0.01 | −0.01 | −0.07 | 0.08 |
| Interpersonal | 0.09 | −0.03 | −0.004 | 0.09 |
| Adaptability | 0.07 | 0.07 | 0.05 | −0.28* |
| Stress | −0.04 | −0.12 | 0.06 | 0.04 |
| Mood | −0.06 | 0.04 | 0.04 | 0.08 |
| $R^2$ | 0.01 | 0.01 | 0.01 | 0.04 |
| $F$ | 0.28 | 0.29 | 0.14 | 0.73 |
| df | 5, 155 | 5, 155 | 5, 155 | 5, 99 |

**Note:** Standardized regression coefficients are reported; * $p < 0.10$

**Table IV.** Regression of emotional intelligence (EQi) and subscales on desirable outcomes

(supervisor satisfaction). However, when we used hierarchical regression to test whether EI predicted the DO when TL was included in the model, we found that EI significantly predicted two DO – leader effectiveness and satisfaction with leader (see Table V). Model 5 predicted a significant amount of variance in leader effectiveness ($R^2 = 0.88$, $F(2, 158) = 557.20$, $p < .001$), and EI significantly predicted leader effectiveness ($\beta = -0.08, p < 0.01$). Similarly, Model 8 predicted a significant amount of variance in satisfaction with supervisor ($R^2 = 0.84$, $F(2, 158) = 421.15$, $p < 0.001$), and EI significantly predicted satisfaction with supervisor ($\beta = -0.08$, $p < 0.01$). In both models the $\Delta R^2$ was significant ($\Delta R^2 = 0.01$, $p < 0.01$), indicating that EI adds predictive strength to the model. This provides some limited support for a direct relationship between EI and DO.

**Table V.** Hierarchical regression of transformational leadership and emotional intelligence on desirable outcomes

| | Model | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| *Extra effort* | | | | | | | | | | | | |
| Transformational leadership | 0.93** | 0.93** | 0.83* | | | | | | | | | |
| Emotional intelligence (EQi) | | −0.03 | −0.07 | | | | | | | | | |
| TL × EI | | | 0.11 | | | | | | | | | |
| $R^2$ | 0.86 | 0.86 | 0.86 | | | | | | | | | |
| $F$ | 955.56** | 477.24** | 316.47** | | | | | | | | | |
| df | 1, 159 | 2, 158 | 3, 157 | | | | | | | | | |
| $\Delta R^2$ | | 0.001 | 0.000 | | | | | | | | | |
| *Leader effectiveness* | | | | | | | | | | | | |
| Transformational leadership | | | | 0.93** | 0.94** | 1.10** | | | | | | |
| Emotional intelligence (EQi) | | | | | −0.08** | −0.003 | | | | | | |
| TL × EI | | | | | | −0.19 | | | | | | |
| $R^2$ | | | | 0.87 | 0.88 | 0.88 | | | | | | |
| $F$ | | | | 1056.48** | 557.20** | 370.39** | | | | | | |
| df | | | | 1, 159 | 2, 158 | 3, 157 | | | | | | |
| $\Delta R^2$ | | | | | 0.01** | 0.000 | | | | | | |
| *Leader satisfaction* | | | | | | | | | | | | |
| Transformational leadership | | | | | | | 0.91** | 0.92** | 1.42** | | | |
| Emotional intelligence (EQi) | | | | | | | | −0.08** | 0.15 | | | |
| TL × EI | | | | | | | | | −0.58 | | | |
| $R^2$ | | | | | | | 0.84 | 0.84 | 0.85 | | | |
| $F$ | | | | | | | 804.39** | 421.15** | 286.36** | | | |
| df | | | | | | | 1, 159 | 2, 158 | 3, 157 | | | |
| $\Delta R^2$ | | | | | | | | 0.01** | 0.003 | | | |
| *Supervisor satisfaction* | | | | | | | | | | | | |
| Transformational leadership | | | | | | | | | | 0.57** | 0.57** | 0.91 |
| Emotional intelligence (EQi) | | | | | | | | | | | −0.03 | 0.15 |
| TL × EI | | | | | | | | | | | | −0.34 |
| $R^2$ | | | | | | | | | | 0.32 | 0.32 | 0.33 |
| $F$ | | | | | | | | | | 44.32** | 21.99** | 14.60** |
| df | | | | | | | | | | 1, 93 | 2, 92 | 3, 91 |
| $\Delta R^2$ | | | | | | | | | | | 0.001 | 0.001 |

**Notes:** Standardized regression coefficients are reported; * $p < 0.01$; ** $p < 0.001$

H3

*H3* predicted that EI would be positively related to TL and negatively related to contingent reward and *laissez-faire*. We tested *H3* using a series of multiple regressions that regressed the EI scale and subscales on the leadership scales (see Tables VI and VII). None of the EI scales or subscales predicted a significant amount of variance in any of the TL scales or subscales. There was no support for *H3*.

H4

*H4* predicted that an interaction between EI and TL would be a significant predictor of DO when included with TL and EI. We conducted hierarchical regressions with TL, EI and the interaction between the two on each dependent variable (see Table V). We also

| | Transformational leadership | Idealized influence | Inspirational motivation | Intellectual stimulation | Individualized consideration |
|---|---|---|---|---|---|
| Emotional intelligence (EQI) | 0.06 | 0.09 | 0.09 | 0.04 | 0.02 |
| $R^2$ | 0.004 | 0.01 | 0.01 | 0.002 | 0.000 |
| $F$ | 0.62 | 1.32 | 1.4 | 0.29 | 0.06 |
| df | 1, 159 | 1, 159 | 1, 159 | 1, 159 | 1, 159 |
| Intrapersonal | 0.03 | 0.04 | 0.06 | 0.06 | −0.01 |
| Interpersonal | 0.03 | 0.05 | 0.03 | −0.04 | 0.05 |
| Adaptability | 0.10 | 0.11 | 0.07 | 0.12 | 0.08 |
| Stress | −0.07 | −0.05 | −0.07 | −0.06 | −0.09 |
| Mood | −0.02 | 0.04 | 0.01 | −0.04 | −0.01 |
| $R^2$ | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 |
| $F$ | 0.33 | 0.46 | 0.39 | 0.33 | 0.26 |
| df | 5, 155 | 5, 155 | 5, 155 | 5, 155 | 5, 155 |

**Note:** Standardized regression coefficients are reported

**Table VI.** Regression of emotional intelligence (EQI) and subscales on transformational leadership

| | Transformational leadership | Contingent reward | *Laissez-faire* |
|---|---|---|---|
| Emotional intelligence (EQi) | 0.06 | 0.02 | 0.03 |
| $R^2$ | 0.004 | 0.000 | 0.001 |
| $F$ | 0.62 | 0.05 | 0.1 |
| df | 1, 159 | 1, 159 | 1, 159 |
| Intrapersonal | 0.03 | −0.01 | −0.03 |
| Interpersonal | 0.03 | −0.02 | −0.06 |
| Adaptability | 0.10 | 0.10 | 0.004 |
| Stress | −0.07 | −0.14 | 0.10 |
| Mood | −0.02 | 0.06 | 0.03 |
| $R^2$ | 0.01 | 0.01 | 0.01 |
| $F$ | 0.33 | 0.44 | 0.34 |
| df | 5, 155 | 5, 155 | 5, 155 |

**Note:** Standardized regression coefficients are reported

**Table VII.** Regression of EQI and subscales on leadership

examined whether the number of followers reporting to a leader impacted the regression analysis. We found that while there were significant bivariate correlations between group size and the dependent variables, group size was not a significant predictor of the dependent variables once TL or EQ were added to the model. All of the other models explained a significant amount of variance in the dependent variables. $R^2$s ranged from 0.32 to 0.88, $p < 0.001$. None of the interaction terms were significant predictors of any of the dependent variables. There was no support for *H4*.

## Discussion

As previously noted, the positive relationship between TL behaviors and organizational outcomes is extremely well established in the academic literature (e.g. Lowe *et al.*, 1996; Avolio and Bass, 1997; Tichy and Devanna, 1986). Data from this study, involving over 2,400 followers assessing the leadership behaviors of 161 leaders, is entirely consistent with those findings. Our results confirm previous studies of the extraordinary effectiveness power (in this instance explaining over 80 percent of the variance in three of the dependent variables) of TL in predicting organizational outcomes. While relationship of this nature are exception in social science research, given that they have been found across many other TL studies in a variety of settings, the more significant contribution of the leadership results may lie in the reassurance that the data were collected from an organizational setting in which the dynamics of the leader-follower relationships seem to be similar to those found across a large variety of organizational and cultural settings.

What is of particular interest in this study is the relationship between EI and DO, and/or the relationship between EI and TL. Previous claims for a relationship between EI and DO have been both speculative (e.g. Cooper, 1997; Goleman, 1998) and the object of scientific investigation (e.g. Law *et al.*, 2004; Schutte *et al.*, 1998). Interpreting the results of the empirical studies is substantially complicated by the previously mentioned lack of agreement regarding a definition or measurement scheme for EI. In this study EI was measured utilizing Bar-On's (1996) EQI. Given the relatively short history of EI, the EQI is one of the longer-lived and most widely-used instruments, and one which has been the object of confirmatory validity studies (Bar-On, 1996; Dawda and Hart, 2000). Unlike previous studies (Barling *et al.*, 2000; Sivanathan and Fekken, 2002; Mandell and Pherwani, 2003) in which the EQI was utilized as a measure of EI, this study finds no evidence of a relationship between EI and DO. The EQI was able to add a small, but statistically significant increment to predictive power for some dependent outcome variables when added to a regression model where the impacts of TL had been parceled out. These findings are not consistent either with prior theory or research results.

While it is impossible to divine the exact reasons why relatively similar studies would result in such different outcomes, methodological differences are one possibility. The importance of sample size to the robustness of analysis and the generalizability of results is well established (Feldt and Ankenmann, 1998; Charter, 1999), with larger samples generally offering more statistical power. Previous EQI/leadership studies based their findings on 49 leaders (Barling *et al.*, 2000), 70 leaders (Sivanathan and Fekken, 2002), and 32 leaders (Mandell and Pherwani, 2003), respectively. The numbers of followers providing input utilized as dependent variables would also be expected to impact the analysis. In the Barling *et al.* (2000) study, data were collected

from 191 followers, in the Sivanathan and Fekken (2002) study, data were collected from 232 followers, and no follower data were collected in the Mandell and Pherwani (2003) study. In the current study, 2,411 followers provided input on the leadership behaviors of 161 leaders, who also completed the EQI. Accordingly, we might expect the large sample size in the current study to allow identification of much weaker effects than previous studies, but this was not the case.

The possibility that the results might be bound to the cultural or organizational circumstances cannot be completely discounted. As previously noted, the current study was conducted in a manufacturing setting in the USA. The relatively large sample size should in and of itself provide some elements of psychological and cultural diversity. Respondents included hourly workers, professional managers, engineers (both industrial and product development), and professional staff, which included computer scientists, marketing and customer service personnel. In the Barling *et al.* (2000) study, data were collected in a pulp and paper organization, in the Sivanathan and Fekken (2002) study, data were collected in a university residence hall setting and in the Mandell and Pherwani (2003), study data were collected on human resource representatives from "volunteering" organizations. To the extent that the interactions in these types of organizations are more affectively based, as opposed to a manufacturing plant, which is largely performance based, we might hypothesize that EI would be a more significant predictor.

The lack of support for hypothesized relationships between EI and DO and TL in this study does not necessarily indicate that those relationships do not exist. Rather, the more appropriate interpretation of the results is that this study does not support a relationship between EI as measured by the EQI and either DO or TL. It is important to note that Bar-On designed the EQI to be a measure of emotional and social functioning (Bar-On, 2001). Not surprisingly, in validation studies (Bar-On, 1997), the overall EQI scores are strongly correlated with high positive affect and low negative affect personality measures. While the notion that the EQI might correlate with DO and/or TL seemed logical and intuitively satisfying when designing this study, it is the instrument was not designed or developed with that in mind. Much of the critical commentary regarding the potential usefulness of the EQI in developing an understanding of organizational dynamics has centered on the fact that it measures a mixture of traits and abilities intending to predict psychological well being. This combination is, unlike the ability models of EI, not consistent with traditional formulations of intelligence, nor was the EQI specifically intended to be a specific measure of competencies associated with workplace success (Emmerling and Goleman, 2003). Given the failure to find support for a relationship with organizational outcomes or leadership it is important to recall the stated purposes of the instrument, and these results should not be taken as a particular indictment of its psychometric properties or utility in other settings.

### *Limitations*

There are some limitations that need to be considered when assessing the results of this study. The current sample is a large and varied one that comes from an actual organizational context where there was serious managerial impetus to provide data accurately and completely. Nevertheless, standard non-response bias and potential for

follower unwillingness to describe their opinions accurately, for fear that the data might be revealed to their managers, are potentially at work.

The high levels of observed correlations between the MLQ measured independent variables and the MLQ measured dependent variables suggests that these relationships may be overstated because of common method variance, since both are based on the ratings of the same subjects, using the same instrument. Our study shares this limitation with much of the research on TL, which is also based on these same MLQ measured independent and dependent variables. Fortunately, because the EQI measure was completed by the leader rather than the followers, there is no possible common method variance contaminating the findings that involve EQ.

*Practical significance*

The results of this study do not support the use of the EQI measure as a useful tool for managerial selection, development or assessment. The very weak effects observed here suggest that the TL variables explained the vast bulk of the variance in the outcome measures. EI may eventually prove to be a useful concept for management practice; however, the results of this study do not commend the use of the EQI for that purpose.

*Future research directions*

Despite the lack of support in this study for EI, as measured by the EQI, our sense is that the concept of EI may still hold promise for improving our understanding of organizational behavior generally, and TL specifically. Issues of definition, psychometric independence, and valid measurement remain largely unresolved. Informed by other studies, which may have had limited generalizability for methodological reasons or common source variance, we sought to illuminate the extent to which a venerable measure of mixed models of EI, the EQI, is related to either TL or to desired outcomes. Utilizing a large sample directly engaged in manufacturing and manufacturing support activities we did find the expected strong positive relationship between TL and desired outcomes. However, we were only able to find very limited support for using EI, as measured by the EQI, as an explanatory variable. In our analysis, EQI measured EI added only a small, albeit statistically significant, amount to our ability to predict desired outcomes. Because these findings are at variance with the other studies, additional research, using a variety of samples and other measures of EI is indicated. To do so would help to clarify whether our failure to find the expected relationships is due to a conceptual problem inherent to the EQI, or the possibility that that EI is not needed for leadership and that what positive benefits there are in EI are already accounted for by other, well-established constructs.

Organizational and leadership researchers may choose to devote additional attention to the possibilities of a relationship between the EQI and outcomes or behaviors of interest, perhaps in different organizational settings or utilizing alternative research designs. However, the more promising approach for revealing the impact of EI on organizational behavior seems to lie in investigators utilizing other measures of EI. Measurement instruments embracing the ability model of EI (e.g. Schutte *et al.*, 1998; Wong and Law, 2002) have been reported in the academic literature and in some cases have been shown to have significant predictive relationships with organizational outcomes (Law *et al.*, 2004; Schutte *et al.*, 1998).

Among other issues, one tends to be suspicious of completely self-reported, self-awareness measures. It would be very useful to see how well EQI or other EI measures, which are self-reported, correlate with follower or peer assessments of EI. At least one 360-degree assessment instrument specifically oriented to the competencies associated with success in the workplace (Sala, 2002) has also been formulated and awaits validity testing. A final suggestion concerns the outcome measures used. While the attitudinal variables predicted here are undoubtedly of interest to managers, it would be arguably much more valuable to see how the EI and TL constructs would perform in the prediction of hard, objectively measured productivity, efficiency or profitability outcomes.

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