

Human Resource Management Review (2002), 12(2):195-214.

doi: 10.1016/S1053-4822(2)00046-3

Workgroup emotional intelligence Scale development and relationship to team process effectiveness and goal focus

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Abstract

Over the last decade, ambitious claims have been made in the management literature about the contribution of emotional intelligence to success and performance. Writers in this genre have predicted that individuals with high emotional intelligence perform better in all aspects of management. This paper outlines the development of a new emotional intelligence measure, the Workgroup Emotional Intelligence Profile, Version 3 (WEIP-3), which was designed specifically to profile the emotional intelligence of individuals in work teams. We applied the scale in a study of the link between emotional intelligence and two measures of team performance: team process effectiveness and team goal focus. The results suggest that the average level of emotional intelligence of team members, as measured by the WEIP-3, is reflected in the initial performance of teams. In our study, low emotional intelligence teams initially performed at a lower level than the high emotional intelligence teams. Over time, however, teams with low average emotional intelligence raised their performance to match that of teams with high emotional intelligence.

1. Introduction

Emotional intelligence was initially proposed by Mayer, DiPaolo, and Salovey (1990) and Salovey and Mayer (1990) as set of social skills and abilities akin to, but distinct from intellectual intelligence. Since then, interest in emotional intelligence has increased dramatically, with several popular books being written on the topic, most notably that by Goleman (1995). More recent books have focused on the contribution of emotional intelligence to management in organizational settings (Cooper & Sawaf, 1996; Goleman, 1998a, 1998b; Weisinger, 1998). Largely, as a result, of this popularization, there are an increasing number of management consultants promoting emotional intelligence interventions in organizations. An unfortunate consequence of this profusion, however, has been a propensity for the authors and consultants involved to make exaggerated claims about the contribution of emotional intelligence to performance and success. Few of these claims have been based on empirical research (see Ciarrochi, Chan, & Caputi, 2000). Rather, the claims have been drawn from anecdotal evidence relating to exceptional individuals. Clearly, a more scientific approach is needed here if the emotional intelligence construct is to achieve credibility. The study we conducted used teams who applied problem based learning methods to study managerial communication. These teams were measured in relation to their individual emotional intelligence and the group's goal focus and process in completing assigned tasks. One purpose of the research outlined in this paper, therefore, was to provide a preliminary empirical test of the validity of the claims that emotional intelligence predicts work performance.

In his 1995 book, Goleman made strong claims about the contribution of emotional intelligence to individual success, and specifically to success in the workplace. He identified intellectual intelligence as contributing 20% towards life success and intimated that the remaining 80% of life success may be attributable to emotional intelligence. While drawing away from this dramatic claim in later work (Cherniss & Goleman, 1998), the stage had been set for some equally inflated and unsubstantiated claims as to the impact of emotional intelligence. Generally, these are based on individual profiles and general observations made linking individual behavior and success to emotional intelligence (e.g., Cooper & Sawaf, 1996; Goleman, 1995). Our observation in respect of these claims is that none of the people cited in these anecdotes actually appear to have had their level of emotional intelligence tested. Further, there seem to be no systematic measures of success, other than the fact that these individuals seem to have good interpersonal and intrapersonal skills or that they have demonstrated significant motivation.

Mayer and Salovey (1997) agree that general intelligence accounts for approximately 10–20% of life success, defined as academic achievement and occupational status. Mayer, Salovey, and Caruso (2000) confirm this assertion by outlining research findings that IQ correlates with various indicators of life success at about the $r=.45$ level. At the same time, they also note that a single personality factor generally only explains a small proportion of life success. While the claims about the link between intellectual intelligence and performance have been researched using empirical studies, research into the link between emotional intelligence and performance has been lacking to date. This may be the result, until recently, of a lack of adequate measures of emotional intelligence. With the advent of a number of measures of emotional intelligence (Bar-On, 1996; Cooper & Sawaf, 1996; Mayer, Caruso, & Salovey, 1999), the time is right to advance our knowledge with respect to the link between emotional intelligence and performance. The specific aims of our research, therefore, were (1) to establish a measure of emotional intelligence appropriate for use in the workplace and (2) to test the proposition that emotional intelligence predicts process effectiveness and goal focus in work teams.

With this in mind, we first outline the development of a measure of emotional intelligence for workgroups: the Workgroup Emotional Intelligence Profile, Version 3 (WEIP-3). We decided to focus on workgroups or teams because of the modern trend for teams in work in organizations (Beyerlein, Johnson, & Beyerlein, 1997). While there is general agreement that the introduction of teams has contributed to performance (Beyerlein et al., 1997), teamwork is not necessarily a universal antidote for poor performance. The question remains, nonetheless, as to what factors contribute to team performance. We argue that the WEIP-3 has potential to provide insights into some personal factors that contribute to team performance.

In our research, we collected evidence for convergent validity for the WEIP-3 by comparing it with existing psychometric instruments. The new scale was then assessed for its usefulness as a predictor of performance in work teams. Performance data were collected from work teams undertaking projects in an undergraduate business subject. These data related to both the processes used by the teams and the weekly goal focus of the teams. Existing studies have shown that group member ability contributes to group performance (Bottger & Yetton, 1987; Ganster, Williams, & Poppler, 1991) and that training improves both individual performance (Wege & Moeller, 1995) and group performance (Firestien & McCowan, 1988; Stout, Salas, & Fowlkes, 1997). All teams in this study received the same level of training, so that the training received by the participants was a consistent moderating variable. In particular, it should be noted that we did not set out to research interventions that may improve emotional intelligence, but rather to determine if emotional intelligence is a predictor of performance in workgroups.

1.1. Emotional intelligence

Although the specific concept of emotional intelligence has only been defined since the beginning of the 1990s (Mayer et al., 1990; Salovey & Mayer, 1990), interest in the interaction of emotions and intelligence is not new. Piaget (1954/1981) explored theoretical links between affectivity and intelligence, while researchers such as Izard (1985), Lazarus (1982), and LeDoux (1989) discussed the link between emotion and cognition in the 1980s. Salovey and Mayer's ideas on emotional intelligence arise from Thorndike's (1920) work on social intelligence and Gardner's (1983) development of the constructs of interpersonal and intrapersonal intelligence. Although Salovey and Mayer first coined the term emotional intelligence, subsequent writers such as Bar-On (1997), Cooper and Sawaf (1996), Goleman (1995, 1998a, 1998b), Shapiro (1997), and Weisinger (1998) have espoused their own notions of emotional intelligence. The construct we initially use in this paper was based on Salovey and Mayer's original model.

Salovey and Mayer's (1990) original construct of emotional intelligence included the ability to deal with one's own and others' emotions and to use this information to assist individuals in problem solving and decision making. In later work, Mayer, Salovey, & Caruso (2000) conceded that this definition was vague and shifted their focus to stress the centrality of reasoning about or understanding of emotional processes to emotional intelligence. They then link this to emotional effectiveness.

The current model of emotional intelligence proposed by Mayer and Salovey (1997) includes the perception, assimilation, understanding, and management of emotions. In this model, perception provides a platform for assimilation and assimilation in turn provides a foundation for understanding. Finally,

understanding contributes to emotional management. An analysis of the data collected in the present research supports Mayer and Salovey's most recent construct for emotional intelligence based on four factors: (1) verbal and nonverbal appraisal and expression of emotion; (2) regulation of emotion in the self and in others; (3) emotional knowledge designed to promote intellectual and emotional growth; and (4) ability to generate emotions to assist problem solving.

While there are similarities and continuities between Salovey and Mayer's (1990, 1994) Mayer and Salovey (1993) earlier research and the work of other authors on emotional intelligence (e.g., Bar-On, 1997; Goleman, 1995), there are some important differences. For example, Goleman's (1998a) construct of emotional intelligence includes motivation and empathy, factors that Mayer, Salovey, & Caruso (2000) consider to extend beyond the confines of emotional intelligence. In a similar fashion, Bar-On (1997) includes a diverse range of factors including assertiveness, self-esteem, and independence. These factors, however, clearly go beyond the scope of Mayer and Salovey's definition of emotional intelligence.

Indeed, Mayer, Salovey, & Caruso (2000) suggest that some conceptualizations of emotional intelligence, particularly those in the popular press, have a greater affinity with personality than intelligence. They point out that their original operationalization of the emotional intelligence construct has evolved over time to focus on the emotional aspects of cognitive activity. Thus, the Mayer and Salovey construct focuses on the link between the cognitive and emotional aspects of intelligence and should not be considered as just another set of personality dimensions.

1.2. Measuring emotional intelligence

Two conceptual issues need to be addressed before development of a measurement instrument for emotional intelligence. The first concerns the type of emotion to be measured: whether to measure mood, affective episode, or both. The second is whether to use a general measure of emotional intelligence or to develop a specific measure focusing on emotional intelligence in the workplace.

In relation to the first issue, various researchers have identified the importance of both moods (George, 1997; George & James, 1993) and affective episodes in work settings (Weiss & Cropanzano, 1996). Morris and Reilly (1987) define moods as diffuse or global feeling states while Ekman (1994) contends that affective episodes or emotions are quite distinct from moods in that they are often more intense, of shorter duration, and usually a reaction to specific stimuli (see also Frijda, 1986). We acknowledge that emotional intelligence and, in particular, an individual's awareness of emotion and his or her ability to regulate emotions may interact with mood states. For measurement purposes, however, we argue that the appropriate focus is on responses to affective episodes and the behavioral manifestations of those episodes, rather than on more generalized mood states. This focus is supported by affective events theory, the framework proposed by Weiss and Cropanzano (1996) for assessing emotions in the workplace. The diffuse nature of moods infers a subdued behavioral response. On the other hand, by focusing on affective episodes, we expect a richer source of data related to emotional intelligence.

The second issue is whether to use a general measure of emotional intelligence or to develop a measure tailored for a specific context. The first available comprehensive measure of emotional intelligence was the Emotional Intelligence Inventory (EQi) developed by Bar-On (1996). The EQi uses a self-report format incorporating 152 items. Bar-On (1996) argues that emotional intelligence refers to skills designed to assist in coping with environmental demands and directly affects overall psychological well-being. This focus seems to emerge from his earlier work on emotional well-being that has been reconceptualized as emotional intelligence (see Bar-On, 1996). An examination of the items in the EQi and Bar-On's (1997) resulting factor analysis of those items shows that self-contentment is a dominant factor, accounting for 23.1% of the variance. It may be that well-being, and not emotional intelligence, is the primary construct that is measured by the EQi. Finally, Bar-On's (1996, 1997) conceptualization of emotional intelligence is not consistent with the construct defined by Mayer and Salovey (1997). Mayer, Salovey, & Caruso (2000) appear to agree with this assessment. They describe Bar-On's construct as a mixed model, combining intellectual, social, and affective abilities.

Recently, several new measures of emotional intelligence have emerged (Cooper & Sawaf, 1996; Mayer, Salovey, & Caruso, 1997; Schutte et al., 1998). Only one of these, however, the interactive Emotional IQ Test (Mayer et al., 1997) and its paper equivalent, the Multi-Factorial Emotional Intelligence Scale (MEIS; Mayer et al., 2000), adheres to the multidimensional construct of emotional intelligence proposed by the original promulgators of emotional intelligence. The Emotional IQ Test is based on an interactive multimedia format on a computer, and is designed to provide an overall measure of emotional intelligence. While this approach is innovative, its administration on large samples is problematic. The multimedia test and the paper test take approximately 2 hours each to complete. Nonetheless, validity data for the MEIS have been provided by the authors (Mayer, Caruso, & Salovey, 1999), who suggest that the MEIS meets the three traditional standards for the measurement of intelligence. Mayer et al. (1999) argue that the first standard is that the measure should reflect performance and not preferred behavior. The second standard is that intelligence should describe a closely related set of abilities that are similar, but distinct from, already established intelligences. Finally, the intelligence should be capable of developing with age and experience.

Ciarrochi et al. (2000) also recently examined the MEIS and found that it was related to specific personality measures. Overall, Ciarrochi et al. were favorably disposed to the potential of the MEIS to contribute to an understanding of human performance, but question whether emotional intelligence could be considered an intelligence. Their research, however, examined the impact of emotional intelligence on mood states and its subsequent correlation to general intelligence (*g*). We disagree with attempts to link emotional intelligence to *g*, because this does not conform to Gardner's (1983) conceptualization of multiple intelligences and particularly the constructs of inter- and intrapersonal intelligence upon which the idea of emotional intelligence is predicated. We have also observed that moods are more diffuse than affective episodes and may provide less substantial evidence in testing for emotional intelligence. Finally, Davies, Stankov, and Roberts (1998) have raised questions about the validity and reliability of existing measures of emotional intelligence.

A further issue with existing emotional intelligence measures is that they are based on an assumption that expressions of emotional intelligence are invariant across situations. That is, the existing measures take no account of the social mores, norms, relations of power, and relationships that are apparent in any behavioural episode. The focus of our research, however, is specifically directed to an individual's affective reaction in a work team. This is an important distinction. By focusing on a work situation, our measure is intended to provide the ability for individuals to reflect on specific behaviors in a specific context. Without wanting to argue the merits of situationism (Bowers, 1973), a *prima facie* argument can be made that a measure of emotional intelligence in the workplace may result in a differing profile from one prepared using information about general life experiences. For example, a measure of emotional intelligence based on family relationships may not return the same results as a profile of emotional intelligence based on work relationships. While there may be similarities in terms of the application of interpersonal skills between work and home, the combination of differential power, varying perceptions of the situation, and established relationships may result in a different set of behaviors being exhibited (Bowers, 1973). Thus, the way a parent deals with a son or daughter regarding the overuse of a telephone may result in a different set of skills from counseling an employee on the overuse of the office telephone. Given the work-related affective events focus of our research, we decided to develop a measure that specifically accounts for behavior in a work team.

1.3. Team performance and team emotional intelligence

Since our research was specifically focused on work team performance and its relation to emotional intelligence, there were two issues to resolve: (1) how to measure team performance and (2) how to measure team emotional intelligence.

With respect to team performance, we were concerned with the measurement of those aspects of team performance that were likely to be influenced by emotional intelligence. For instance, in knowledge-based work or in the service industry, the process used to achieve an outcome or provide a service may be as important a predictor of performance as a cost benefit analysis of the eventual outcome. Weiss and Cropanzano (1996) argue that emotional factors can have a long-term effect on team performance, but are not necessarily immediately apparent. We therefore decided to focus on the quality of the process used by

the team and the outcomes in relation to goals set by the team as indicators of relative performance. If we had been interested in general factors of intelligence, a performance measure based on economic outcome indicators may have been appropriate. Since our focus was on the emotional aspects of team work, it was appropriate to measure both team process and team goal focus as an indicator of team performance (Brannick, Salas, & Prince, 1997).

The second issue to resolve was how to measure the emotional intelligence of work teams. While assessment of an individual's emotional intelligence is controversial in terms of the method of measurement (Davies et al., 1998), there is wide acceptance of the appropriateness of measuring individual attributes or qualities. The measurement of team attributes, however, is more problematic. The question is whether the influence of emotional intelligence on teams can be considered to be an aggregated phenomenon, or does the individual with the highest emotional intelligence or the leader of the group (Atwater & Yammarino, 1992) have influence over how the group operates? We argue for the former on the basis of the research on group decision making. Pate, Watson, and Johnson (1998), for example, have shown that the decision-making ability of a group is generally a better indicator of performance than the best decision-maker in the group. Finally, we were aware that most of the teams in the present study rotated the leadership role, so that identification of a clear group leader was not feasible. Thus, we expected to find that teams with high averaged emotional intelligence would use more effective group processes, and would be more goal-focused than groups whose average emotional intelligence was low.

1.4. Convergent validity of the WEIP-3

In developing the WEIP-3, we initially adhered to Salovey and Mayer's (1990) original construct of emotional intelligence and prepared items to reflect three scales. The first was the Ability to Deal With Your Own Emotions. The second scale was the Ability to Deal With Other's Emotions. The final scale referred to the Ability to Use Emotions to Assist in Problem Solving and Decision Making. As can be seen later in this paper, however, factor analysis revealed seven factors: awareness of own emotions; ability to discuss own emotions; use of own emotions to facilitate thinking; ability to recognise others' emotions; ability to detect false displays of emotion in others; empathetic concern; and ability to manage others' emotions. These factors conform more closely to Mayer and Salovey's (1997) more recent construct definition of emotional intelligence that includes perception, assimilation, understanding, and management of emotions (see Fig. 1).

Before the WEIP-3 could be used in the test of team performance, it was necessary to collect evidence for convergent validity to determine if the WEIP-3 was correlated with existing measures. We identified five existing scales for this purpose: (1) the Self-Monitoring Scales (Lennox & Wolfe, 1984), (2) the Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), (3) the Interpersonal Reactivity Index (IRI) (Davis, 1994), (4) the Job Associate-Bisociate Review Index (JABRI) (Jabri, 1991), and (5) Emotional Control Scale Riggio, 1986).

1.4.1. Self-Monitoring Scale

Since, by definition, individuals with high emotional intelligence are able to manage with their own emotions and to manage the emotions of others, it is reasonable to anticipate that they will be able to manage relationships with others successfully. As a result, we expected to find a correlation between the Ability To Deal With Own Emotions scale of the WEIP-3 and measures based on Lennox and Wolfe's (1984) Revised Self-Monitoring Scale. This scale includes two factors, each comprising two subfactors: Acquisitive Self-Monitoring (Ability to Modify Self-Presentation, Sensitivity to Others) and Protective Self-Monitoring (Cross-Situational Variability, Attention to Social Comparison). We expected to find a relationship with Acquisitive Self-Monitoring and especially the Ability to Modify Self-Presentation. The Ability to Deal With Others' Emotions scale of the WEIP-3 was similarly expected to correlate with the Sensitivity to Others' subscale of Acquisitive Self-Monitoring. We anticipated weaker relationships with Protective Self-Monitoring, and we specifically anticipated no relationship with Cross-Situational Variability. This is because we see emotional intelligence as being concerned with managing emotional situations, rather than altering personal behaviors specifically to fit into a social situation.

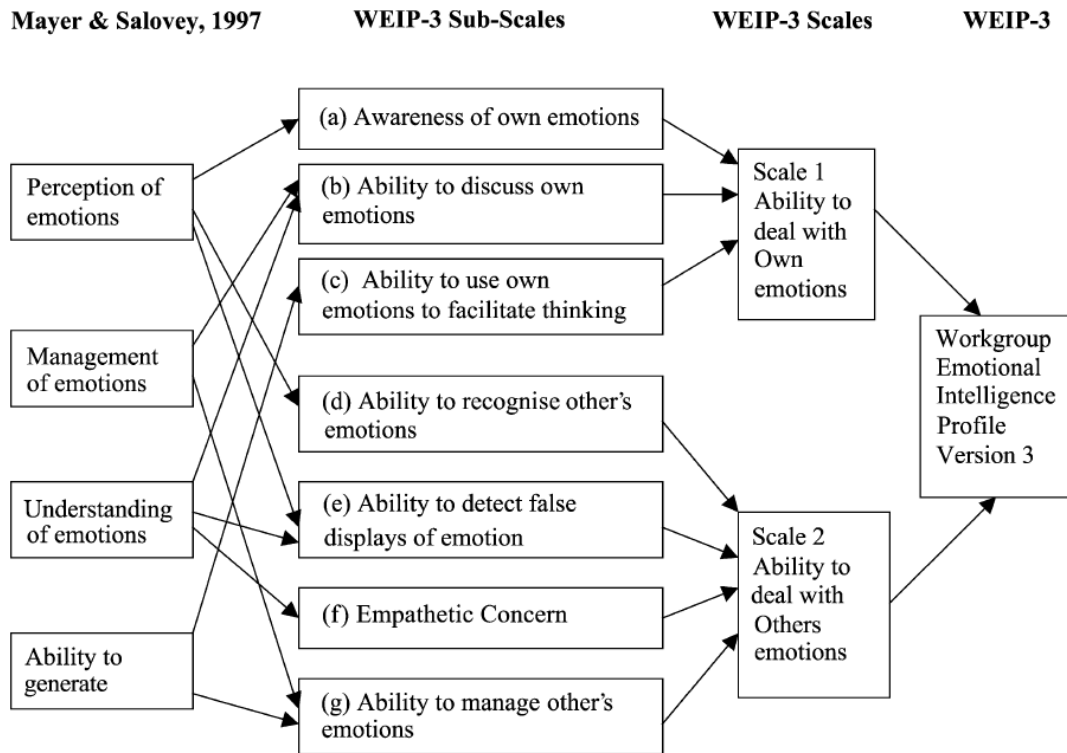


Fig. 1. Comparison of emotional intelligence constructs.

1.4.2. Trait Meta-Mood Scale

We expected to find that the WEIP-3 scales would correlate with existing instruments designed to assess an individual's propensity to be in touch with their emotions and to be able to control their emotions. The TMMS (Salovey et al., 1995) measures attention to emotions, clarity of emotional experience, and ability to repair emotions. We therefore anticipated that the TMMS scales would be related to the WEIP-3 measures of dealing with own emotions and ability to deal with others' emotions.

1.4.3. Interpersonal Reactivity Scale

The inclusion of empathy as a component of emotional intelligence is somewhat contentious. While some writers include empathy in their models of emotional intelligence (Bar-On, 1997; Cooper & Sawaf, 1996; Goleman, 1995, 1998a, 1998b), Mayer and Salovey (1997) see empathy as a shadow construct—related to, but not an essential component of emotional intelligence. Nonetheless, we considered it important to correlate the WEIP-3 with a measure of empathy. We chose the IRI (Davis, 1983) because it measures both cognitive (Hogan, 1969) and emotional (Mehrabian & Epstein, 1972) constructs of empathy. This scale includes four dimensions: Perspective Taking, Empathetic Concern, Fantasy, and Personal Distress. We anticipated that there would be a link between the scales of Perspective Taking and Empathetic Concern of the IRI and the WEIP-3 ability to deal with the emotions of others. The IRI also includes a scale measuring personal distress experienced as a result of empathetic feelings. In this respect, we anticipated that there would be a negative correlation between the WEIP-3 scales and the Personal Distress scale, because emotional intelligence involves the management of such emotions. No relationship with the Fantasy scale of the IRI was anticipated.

Fig. 1. Comparison of emotional intelligence constructs.

1.4.4. Job Associate–Bisociate Review Index

In order to test the problem-solving aspects of emotional intelligence, the JABRI (Jabri, 1991) was administered. The JABRI draws on the work of Koestler (1964), and is an instrument that measures reasoning using the concept of associate and bisociate propensities in problem solving. The associate thinker is constrained into adopting logic using tried and tested methods for problems solving, while the bisociate problem-solver would be expected to adopt a more creative and intuitive style of problem solving (Jabri, 1991). The Bisociate scale of JABRI was predicted to correlate with the WEIP-3 measures of ability to deal with own emotions and ability to deal with others' emotions, but we expected that the Associate scale of JABRI would not correlate with WEIP-3 scores. This reflects the focus of emotional intelligence on emotional information rather than on the factual information used in rational intelligence.

1.4.5. Emotional control

Finally, in relation to self-awareness, we expected to find that the Emotional Control Scale of the Social Skills Index (Riggio, 1986) would be positively related to both WEIP-3 scales of Ability to Deal With Own and Other's Emotions. This expectation draws on the construct definition of emotional intelligence, which highlights the ability to be able to analyze and manage emotions.

2. Method

2.1. Participants

Participants in our study were 448 Australian undergraduate students enrolled in a managerial skills and communication course. These students used problem-based learning (Engel, 1993) and worked in designated three- to seven-person "Semi-Autonomous Learning Teams" for the duration of the 14-week semester. Personal relationships that emerged from this style of working were expected to correspond to a work setting where project teams are formed to undertake tasks within a specific period. The teams were asked to submit weekly reports of their team meetings for 9 weeks of the semester.

Participation in the study was voluntary, but all students nonetheless participated in at least one part of the study. The age of the participants ranged from 17 to 50 years, with a mean age of 19.7 years. Of the sample, 56.3% were female and 95% reported themselves as either currently being engaged in full- or part-time employment or having been employed in the past. The average length of employment for the participants was 2.7 years. One-fourth of the sample reported their country of birth being in Asia.

2.2. Measures

WEIP-3: Development of the WEIP-3 and its prototypes had been in progress for 2 years at the time of the present study. Early development involved a detailed content analysis of the literature relating to emotional intelligence. From this analysis, 44 statements and concepts were identified as contributing to the emotional intelligence construct. A Q sort of these statements resulted in a number of specific themes emerging providing an initial construct definition of emotional intelligence.

Originally, three themes were identified: (1) dealing with own emotions, (2) dealing with others emotions, and (3) use of emotions in problem solving (Salovey & Mayer, 1990). Based on these three themes, statements from the literature content analysis were further sorted to create subthemes. Three subthemes were identified as fitting under the broad theme of dealing with own emotions. These were: (1) awareness of own emotions, (2) control of felt emotions, and (3) ability to display emotions. Similarly, the broad theme of dealing with another's emotions included three subthemes: (1) recognition of other's emotions, (2) ability to manage other's emotions, and (3) empathy. Finally, the problem-solving theme was considered to be a single construct. These constructs were consistent with the early definitions for emotional intelligence (e.g., Mayer & Salovey, 1993), but differed by separating abilities in relation to self and abilities in relation to others.

The WEIP-3, however, embodies a considerable refinement on the earlier versions of the scale (WEIP-1 and WEIP-2). In particular, between the development of WEIP-2 and WEIP-3, Mayer and Salovey (1997) altered and refined their operational definition of emotional intelligence significantly. Thus, while there is

continuity with the earlier work of Salovey and Mayer, their conception of the construct has evolved as a cognitive model, rather than as a set of personality traits (Mayer & Salovey, 1997). The WEIP-3 was therefore modified from the WEIP-2 to conform to Mayer and Salovey's (1997) revised construct, and provides the basis for the present study.

The WEIP-3 uses a seven-point Likert-type response scale, where 1 represents strong disagreement and 7 indicates strong agreement. The instrument includes items designed to measure felt emotional experience (e.g., "I can explain the emotions I feel to team members"), discrepancies between felt and expressed emotions (e.g., "When I am frustrated with fellow team members I can overcome my frustration"), methods of handling expressed emotions in others (e.g., "I can listen to fellow team members without judging them"), and techniques used to apply emotion in problem solving (e.g., "When my group has brainstorming session, I can get enthusiastic about it").

2.3. Procedure

Validation data for the WEIP-3 were collected over a 3-month period. Respondents completed the validation instruments as a "self-awareness" component of the course. Feedback on the outcomes of the tests, including individual scores, class averages, and benchmark norms were provided 1 week after completion of each scale. A final debrief on the study report was given to the participants in the final week of the course. The confidentiality of each of the team members was protected through the use of unique individual identifiers for each member of the team, known only to each individual participant. Reports were prepared using that identifier. The WEIP-3 was completed after team members had been working as a team for approximately 12 weeks.

2.4. Team performance measurement

Team performance data were based on "log sheets" that the teams submitted weekly over a 9-week assessment period. Each week of the reporting period, teams were provided with a specific topic in management skills and communication. They were asked to explore the topic using problem-based learning techniques (Engel, 1993). The team meetings were a compulsory part of the course, and consisted of two 1-hour meetings per week. At the end of each meeting, all teams were required to submit a written log, detailing the goals they had set for the week and the processes that contributed to their learning. They were also asked for information on team interactions, team processes, and any significant learning or insights the meeting produced.

Three independent raters subsequently assessed the weekly team log sheets. As an initial step, the log sheets were assessed for completeness and availability. Log sheets from 44 teams satisfied these criteria and were included in the analysis. The raters assessed seven criteria: three relating to team process and four assessing the team's goal focus. Process criteria reflected quality, understanding, and attention to group processes. Goal focus criteria dealt with the generation of appropriate goals and the focus the team had on goal attainment. Typical items used for assessing goal focus included "Are the goals clearly articulated in this session?" and "Does the group remain focused on the goals in this session? (Do they return to set goals if diverted?)". Typical items in the process quality criteria included "How concerned were the group with monitoring its own application of the processes?" and "How appropriate were the processes for learning about the content?"

The raters met prior to marking the log sheets and each of the criteria was discussed and parameters were set for the assessment of each. Seven-point Likert-type scales were used. Data were collected over a 9-week period, but the first week was a settling in period and excluded from the analysis. The reliability of the independent markers scoring for each of the teams were checked for each week using Cronbach's alpha reliabilities for the process effectiveness and goal focus criteria. These averaged .74 for process effectiveness and .75 for the team goal focus criteria over the 9 weeks of scoring. Scores on the process effectiveness and goal focus criteria were averaged for each week to give two weekly scores for each team: (1) process effectiveness and (2) goal focus.

3. Results

An exploratory factor analysis was performed to investigate the underlying structure of the WEIP-3. Preliminary analysis of the item correlation matrix revealed a number of correlations above .40, suggesting that the data were appropriate for factor analysis (Tabachnick & Fidell, 1996). The Kaiser–Meyer–Olkin measure of sampling adequacy was .82 while Bartells' test of sphericity was 5440 ($df = 1326$, $P < .01$), which further confirmed the appropriateness of the data for factor analysis.

Principal axis factor analysis with varimax rotation (loadings $> .4$) of the 52 items in the WEIP-3 was employed. Factors were chosen on the basis of eigenvalues greater than unity and interpretability in the context of the Mayer and Salovey (1997) construct for emotional intelligence. This resulted in the adoption of a seven-factor solution. Items that did not load on factors or cross-loaded were deleted from the factor solution, leaving 27 items in the final factor structure. The seven factors were labeled: (a) awareness of own emotions, (b) ability to discuss own emotions, (c) use of own emotions to facilitate thinking, (d) ability to recognise others' emotions, (e) ability to detect false displays of emotion in others, (f) empathetic concern, and (g) ability to manage others' emotions. These factors, however, were grouped into two broader scales: (1) Ability to Deal With Own Emotions (Factors a–c) and (2) Ability to Deal With Others' Emotions (Factors d–g). These are referred to in the remainder of this paper as the two WEIP-3 scales. The seven factors that emerged from the original analysis are referred to as the WEIP-3 subscales (see Fig. 1). Descriptive statistics for the scales and subscales are given in Table 1. (Further analyses presented in this paper are based on the WEIP-3 scales only, although analysis based on the subscales produced similar results. Results of the detailed analysis of subscales are available on request from the first author.

Table 1

Means, standard deviations, and intercorrelations for WEIP-3 scales, and subscales

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. (a) Aware of own emotion	11.01	1.66	.58									
2. (b) Discuss own emotion	16.15	4.76	.24	.75								
3. (c) Emotions facilitate thinking	36.13	5.86	.24	.35	.78							
4. Scale 1: Deal with own emotion	63.23	9.40	.46	.77	.84	.79						
5. (d) Recognize others' emotion	16.56	2.39	.31	.15	.24	.28	.83					
6. (e) Detect false emotions	10.03	2.01	.20	.10,ns	.21	.22	.31	.63				
7. (f) Empathy	21.81	3.50	.23	.21	.34	.36	.25	.07,ns	.71			
8. (g) Manage others' emotion	23.72	4.51	.28	.43	.41	.52	.23	.23	.36	.79		
9. Scale 2: Deal with others' emotion	72.16	8.47	.38	.40	.48	.57	.58	.48	.70	.80	.79	
10. Overall WEIP-3 score	135.49	15.97	.48	.67	.75	.89	.48	.39	.59	.74	.87	.86

Figures on diagonal are Cronbach's alpha reliability coefficients. All correlations significant at $P < .01$, unless otherwise indicated.

3.1. Validity of the WEIP-3

We tested two types of validity for the WEIP-3. Convergent validity involves a significant correlation between the scale and the test variable. Discriminant validity is obtained when the correlation between the scale scores and the test scale is shown to be nonsignificant. Convergent validity of the 27-item WEIP-3 was tested using Revised Self-Monitoring Scale (Lennox & Wolfe, 1984), the TMMS (Mayer & Salovey, 1995), the IRI (Davis, 1994), the JABRI (Jabri, 1991), and the Emotional Control Scale of the Social Skills Index (Riggio, 1986). Correlations between these measures and the 27-item WEIP-3 as well as the two WEIP-3 scales are shown in Table 2.

As predicted, there was a significant correlation between the WEIP-3 and all aspects of the Acquisitive Self-Monitoring. Significantly, the strongest correlation with the Self-Monitoring Scale was obtained between ability to deal with the emotions of others in the WEIP-3 scale and Acquisitive Self-Monitoring. Also, as expected, correlations with Protective Self-Monitoring were relatively weaker. Correlation with Cross-Situation Variability was non-significant as predicted, and it is noteworthy that the WEIP-3 scales correlated negatively with the Attention to Social Comparison scale.

Table 2
Correlations between the WEIP-3 and validation measures

	Ability to Deal With Own Emotions scale	Ability to Deal With Other's Emotions scale	Overall WEIP-3
Revised Self-Monitoring Scale			
Acquisitive Self-Monitoring	.25**	.40**	.36**
Modify Self-Presentation	.22**	.33**	.31**
Sensitivity to Others	.18**	.32**	.28**
Protective Self-Monitoring			
Cross-Situation Variability	-.10	-.03	-.08
Attention to Social Comparison	-.20**	-.13 *	-.19**
TMMS			
Attention to Moods	.03	.08	.06
Clarity of Moods	.25**	.17**	.24**
Repair of Moods	.28**	.22**	.28**
IRI			
Perspective Taking	.43**	.27**	.40**
Empathetic Concern	.08	.15 *	.13 *
Fantasy	-.05	.03	-.01
Personal Distress	-.25**	-.29**	-.31**
JABRI			
Associate	.09	.04	.07
Bisociate	.32**	.29**	.34**
Emotional Control Scale	.24**	.27**	.29**

* $P < .05$.

** $P < .01$.

Results with respect to the TMMS indicated significant correlations with Clarity of Moods and Repair of Moods, but not with Attention to Moods. However, given the affective events focus of the WEIP-3, we should have anticipated no relationship with Attention to Moods. It could be argued that compulsively paying attention to one's emotions might be as unproductive as a lack of attention.

Both scales of the WEIP-3 correlated with the Perspective Taking scale of the IRI, but only Ability to Deal With Others' Emotions scale correlated with Empathetic Concern, and then only at the .05 level. As expected, there was a significant negative correlation between the WEIP-3 scales and the Personal Distress scale.

Further, and as expected, the Bisociate scale of the JABRI was correlated both to the Ability to Deal With Own Emotions scale and the Ability to Deal With Others' Emotions scale of the WEIP-3, while correlations with the Associate scale of the JABRI were nonsignificant. Finally, both of the WEIP-3 scales correlated with scores on the Emotional Control scale as we predicted.

In summary, the WEIP-3 and its scales performed admirably in the tests of convergent and discriminant validity. Results show that the WEIP-3 can be factored into seven subscales or two broad scales (see Fig. 1). Nonetheless, the high correlation between the overall scale score and the two broad scales, combined with the good Cronbach's alpha reliability obtained for the overall scale (see Table 1) suggest that the aggregate WEIP-3 scale can also be used as a unidimensional index of emotional intelligence in workgroups. In the following section, we follow up by describing an application of the WEIP-3 scale in a test involving measures of workgroup process effectiveness and goal focus.

3.2. Performance data results

Weekly ratings for the process effectiveness and goal focus criteria measures of team performance were analyzed. A set of time-series was developed by charting changes in team performance on these criteria. A least-squares linear fit was then applied to the process and goal time-series data for each team. This analysis indicated significant trends during the 9 weeks of measurement.

To analyze the relationship between the performance data and emotional intelligence, both scales of the WEIP-3 were summed for each individual (see Fig. 1). An average team WEIP-3 score was calculated for each of the 44 teams included in this analysis. This will be referred to as the team average WEIP-3 score. Correlation of the slopes of each team's weekly goal focus and process effectiveness scores with the team average WEIP-3 score indicated a significant relationship for goal focus, $r(44) = -.34$, $P < .05$, but not for process effectiveness, $r(44) = -.21$, ns.

To investigate these effects further, we divided the teams into two groups, one containing the 15 highest average emotional intelligence teams and the other comprising the 15 lowest average emotional intelligence. Table 3 shows median scores in each group for the team report scores from the first and last weeks. The increase in scores for the low emotional intelligence teams was significant for both process, Wilcoxon signed ranks $z(15) = 2.61$, $P < .01$, and goal, Wilcoxon signed ranks $z(15) = 2.79$, $P < .01$. For the low emotional intelligence teams, most of the improvement in goal focus was achieved over the first 3 weeks. In contrast, improvement for process was steady across the entire 8-week period. The change in scores between the first and last weeks was not significant for the high emotional intelligence teams for either process effectiveness or goal focus.

4. Discussion

Overall, results of this study provide evidence that the WEIP-3 scale has convergent validity with respect to existing scales relating to the emotional intelligence construct. The scale has also demonstrated the predicted pattern of relationships with associated constructs. Importantly, we also found that average team emotional intelligence based on WEIP-3 scores predicted team performance. High emotional intelligence teams operated at high levels of performance throughout the study period. Low emotional intelligence teams, on the other hand, initially performed at a low level, but equaled the performance of the high emotional intelligence teams by the end of the study period.

The results of the validation study support the idea that the WEIP-3, as a measure of emotional intelligence, is discernible from measures of other related constructs. In relation to self-monitoring, for example, it was notable that the strongest correlation between the WEIP-3 and Lennox and Wolfe's (1984) Revised Self-Monitoring Scale was with the ability to deal with others' emotions. Lennox and Wolfe argue that the ability to modify self-presentation and sensitivity to others are important factors in an individual's ability to manage relationships with others, and to improve personal position. The correlations that we obtained in the present study suggest that the ability to deal with others' emotions contributes to successful acquisitive self-monitoring. In particular, the WEIP-3 scale of ability to manage the emotions of others was significantly correlated with all components of Acquisitive Self-Monitoring. Another notable outcome of the present study was that no correlation was found between the WEIP-3 scores and the Cross-Situational Variability scale of Protective Self-Monitoring. This contrasts with the significant negative correlations achieved between the Self-Monitoring Construct of Attention to Social Comparison and the WEIP-3 scales. The nonsignificant correlations support the proposition that the WEIP-3 measures a construct related to managing relationships, rather than just an attempt to meet the expectations others.

Table 3

Median team performance scores from Weeks 2 and 9 for teams with high and low emotional intelligence

	Goal focus		Process effectiveness	
	High WEIP-3	Low WEIP-3	High WEIP-3	Low WEIP-3
Week 2	4.8	3.3	6.0	5.0
Week 9	5.5	5.5	6.2	5.7

Change	0.7	2.2**	0.2	0.7**
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**Wilcoxon z, $P < .01$.

Two of the three sets of correlations with the TMMS were also in the directions expected and serve further to increase our confidence in the veracity of the WEIP-3 as a measure of emotional intelligence. The TMMS scales of Clarity of Moods and Repair of Moods correlated primarily with the Ability to Deal With Own Emotions scale. The ability to repair moods is especially important because it allows the individual to overcome personal setbacks and thereby to manage one's own and others' emotions. Unexpectedly, however, there was no correlation between the TMMS scale of Attention to Moods and the WEIP-3. Upon reflection, the lack of a correlation between these scales should have been anticipated. This result reflects the fact that emotional intelligence, as operationalized in the WEIP-3, is concerned with the management of affective events, whereas the items in the TMMS scale of Attention to Moods refer to focusing on one's own emotions. Attending to Moods as an isolated factor may not contribute to emotional intelligence, but as Mayer and Salovey (1997) suggest, is a preliminary requirement to managing emotions. A high score on the Attention to Moods scale may indicate a preoccupation with attending to one's own emotions that may also indicate a lack of ability to manage emotions.

Findings in relation to the JABRI were especially encouraging. As expected, there was a strong pattern of correlation with the more intuitive, creative Bisociate scale, but no correlation with the logical and rational approach implied in the Associate scale. This result provides further confirmation that the WEIP-3 scales are measuring an aspect of thought processing that is distinct from concepts of intelligence based on rationality.

Finally, results with respect to the IRI and the Emotional Control scale were also in line with our expectations. Indeed, the negative correlation with Personal Distress demonstrates the fact that the WEIP-3, consistent with the emotional intelligence construct, measures the management of emotions. The negative correlation implies that, rather than avoiding personal distress, people with emotional intelligence prefer to manage these emotions. Finally, we note that the weak correlations with Empathetic Concern support Mayer and Salovey's (1997) view that empathy is a shadow construct of emotional intelligence, rather than a substantive component (see also Mayer et al., 2000).

Turning now to the results in respect of team performance, we argue that an important finding of our study is that low emotional intelligence teams, while not performing initially at a high level in relation to goal setting or process, can perform as well as high emotional intelligence teams over time. At the beginning of the team reporting period, the low emotional intelligence teams had lower performance than the high emotional intelligence teams for both process and goal criteria. By the end of the reporting period, however, the difference in performance for the high and low emotional intelligence teams had essentially vanished for the goal criteria and declined by half for the process criteria. This reduction in the performance gap between the two groups of teams appears to be attributable to the significant improvements made by the low emotional intelligence teams only.

At this stage, we can make no definite conclusions about the reason for this improvement. While we can say that the high emotional intelligence teams seemed to have the requisite skills from the outset to perform well against goal focus and process criteria and that low emotional intelligence teams appeared to lack these skills, we cannot at this stage of our research point to the reason for this change. A number of factors may have produced this result, including training, familiarity with other team members, or dominant team members emerging whose individual skills improved the performance of the team. Future research will explore these possibilities.

Indeed, remembering that WEIP-3 scores were taken at the end of the reporting period, this finding also suggests that the attributes measured by the process and goal constructs may be improved independently of emotional intelligence as measured by the WEIP-3. This is because the low emotional intelligence teams eventually improved their performance, but the individuals who make up these teams continued to have lower emotional intelligence.

5. Limitations and future research

The present research is only a beginning of a larger program to study the role of emotional intelligence in team performance. As such, there are many areas for improvement and for further research. In particular, we recognize that our study is subject to some important limitations. These include the use of student teams, accounting for the moderating effects of training and group dynamics, and the impact of leadership.

The first and most obvious limitation of the present study is that participants were undergraduate students. Although almost all of the respondents did have some work experience, they clearly were artificial teams in the true meaning of the term work teams. We expect, nonetheless, that these results should replicate in ad hoc teams created in the work place for specific short-term projects. While this finding would hold true for these short-term teams, it appears likely that for long-term teams, it may only be the initial performance that will be effected. The current research needs to be extended from student workgroups to teams in the professional workplace.

A second limitation concerns the moderating effects of training and group dynamics on the WEIP-3 scores. The current research design did not allow us to determine whether learning influenced the performance data, because measures were not taken prior to the beginning of training. Future studies will include pre- and postmeasures of emotional intelligence to see if training or awareness raising does influence the emotional intelligence of individuals.

Furthermore, the effects of the internal structure of the groups, such as the emotional intelligence of the leader and the homogeneity and heterogeneity of the teams, were not analyzed. From the performance data alone, it is not possible to determine whether the improvements of the low emotional intelligence teams were attributable to the training they received, or to the increased interpersonal familiarity team members gained over the duration of the study. Future studies are needed to compare low emotional intelligence teams that receive training but meet on a regular basis, with similar groups who meet on the same schedule but receiving no training. Studies on the effects of the emotional intelligence of team leaders may also be of interest.

6. Implications and conclusions

The present study has produced some important results that have implications for both research and practice. The WEIP-3 measurement scale has been shown to correlate with measures of related constructs. In particular, our results support the proposition that the WEIP-3 measures a qualitatively different construct from those measured with existing scales such as the Revised Self-Monitoring Scale or TMMS. The WEIP-3 has also been shown to be distinguishable from measures designed to assess rational thought processes. Finally, it should be remembered that the WEIP-3 is also distinctly different from currently available measures of emotional intelligence because it is specifically designed for use in workgroups. Certainly, the results provide us with the confidence to assert that the WEIP-3 seems to be tapping a potentially useful index of individual and team performance.

A particularly interesting finding of the present study was that low emotional intelligence work teams initially performed at a lower level than high emotional intelligence teams. This has implications for managers, suggesting that organizations could profit by identification of high and low emotional intelligence work teams, so that interventions can be focused on the low emotional intelligence teams where maximum benefits can be realized.

Acknowledgments

This research was funded through Australian Research Council Grant A79801016. We would like to express our appreciation to Alexia Lennon, Lyn McDonald, and Glenda Wearing, who assisted with the performance ratings.

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