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The relationship between transformational leadership behaviors, psychological, and training outcomes in elite military recruits ☆

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ABSTRACT

Two studies examined the effects of a differentiated model of transformational leadership on follower outcomes. In Study 1, 484 UK Royal Marine recruits completed questionnaires about their trainers' leadership behaviors and their own attitudes towards training. Training outcome was measured as successful completion of training or non-completion. Discriminant function analyses identified that fostering acceptance of group goals, inspirational motivation, appropriate role model, individual consideration, and contingent reward significantly discriminated between pass and failure. A separate discriminant function analyses revealed that the attitudinal variables of self-confidence, resilience, and satisfaction also successfully discriminated between pass and failure. Study 2 used a true experimental design to examine the effectiveness of a transformational leadership intervention. Participants were 85 experimental and 67 control recruits who completed questionnaires at weeks 5 and 15 of recruit training. Results revealed that 3 of the 5 key leadership behaviors, and all of the 3 recruit attitudinal variables measured, were significantly enhanced by the intervention.

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Transformational leadership behaviors have been shown to positively impact a wide range of individual and organizational outcomes in a variety of contexts including military (Bass, Avolio, Jung, & Berson, 2003; Dvir, Eden, Avolio, Bass, & Shamir, 2002), sport (Charbonneau, Barling, & Kelloway, 2001), business (Barling, Weber, & Kelloway, 1996; Jung, Chow, & Wu, 2003; Podsakoff, MacKenzie, Moorman, & Fetter, 1990; Howell & Avolio, 1993), the public sector (Rafferty & Griffin, 2004), and education (Koh, Steers, & Terborg, 1995). However, the majority of this research has been correlational in nature with relatively few researchers utilizing experimental designs. Furthermore, the majority of this research has utilized a global or a reduced factor structure representation of transformational leadership. The current paper describes two studies that sought to extend the intervention work of Barling et al. (1996), Dvir et al. (2002), and Poppor, Landua and Gluskinos (1992). The first study used a cross-sectional design to examine the relationship between the separate sub-dimensions of transformational leadership behaviors and selected recruit attitudinal variables on training outcome in military recruits undergoing basic training. The second study used an experimental design to examine the effectiveness of an intervention designed to enhance the key leader behaviors (as identified in Study 1) of recruit trainers and produce corresponding effects on the recruit attitudinal variables measured. Consequently, this introduction first identifies an appropriate measure of transformational leadership that allows for differentiation and then reviews follower attitudinal variables that are theorized to be positively related to performance and positively impacted by transformational leadership behaviors.

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Despite the considerable volume of research examining transformational leadership theory there still remain questions regarding the conceptualization of the construct and its measurement (see, for example; Antonakis, Avolio & Sivasubramaniam, 2003; Rafferty & Griffin, 2004). A number of different tools have been developed to measure transformational leadership behaviors, including the Multifactor Leadership Questionnaire (MLQ) (Avolio, Bass & Jung, 1995; Bass & Avolio, 1995), the Charismatic Leadership Scale (House, 1977), and the Transformational Leadership Inventory (TLI) (Podsakoff et al., 1990). The most widely used of these is the MLQ and its variant forms (Avolio et al., 1995). However, the MLQ has received only mixed empirical support regarding its discriminant validity and factor structure (Avolio et al., 1995; Bycio, Hackett, & Allen, 1995; Carless, 1998; Tejeda, Scandura, & Pillai, 2001; Tepper & Percy, 1994). This has led researchers to adopt alternative approaches to the conceptualization and measurement of transformational leadership. For example, some authors have conceptualized and measured transformational leadership as a global construct (e.g., Dvir et al., 2002; Jung et al., 2003; Pillai, Schriesheim, & Williams, 1999), whilst others have conceptualized and measured transformational leadership as a reduced set of factors (e.g., Barling et al., 1996; Charbonneau et al., 2001; Tejeda et al., 2001), and still others have utilized a fuller factor structure (e.g., Antonakis et al., 2003; Podsakoff, MacKenzie, & Bommer, 1996). Some researchers have argued that differentiation is pointless because of the high inter-factor correlations (e.g., Carless, 1998; Judge & Bono, 2000). However, Antonakis et al. (2003) recently called for researchers to adopt differentiated models that allow for a more detailed examination of the specific sub-components of transformational leadership behaviors, especially in research that involves leader development (Antonakis et al., 2003).

The Antonakis and colleagues' suggestion is further strengthened when a brief review of the studies that have adopted and analyzed a differentiated model of transformational leadership is conducted. The results of these studies reveal that the different leadership behaviors have very different relationships with outcomes, which in part appears to depend on the nature of the outcome and context. For example Podsakoff et al. (1990) found that, whilst the majority of the behaviors examined in their study demonstrated hypothesized relationships, some crucial differences were evidenced, namely that intellectual stimulation was negatively related to trust and satisfaction. A further study by Podsakoff et al. (1996) revealed that intellectual stimulation and high performance expectations were both positively related to role conflict and high performance expectations was negatively related to general satisfaction. In the same study, high performance expectations were positively related to courtesy. In another study, Rafferty and Griffin (2004) found that intellectual stimulation was positively related to affective commitment and continuance commitment. This study also found that vision was negatively related to continuance commitment and role breadth efficacy. Lowe, Kroeck and Sivasubramaniam (1996) conducted a comprehensive (including published and unpublished papers) review of transformational leadership studies that had used the MLQ. Their review revealed that, while the different transformational leader behaviors all demonstrated a positive relationship with leader effectiveness, the magnitude of this relationship was often different and varied widely across studies. Collectively, these results suggest that collapsing transformational leadership behaviors into one global dimension might obscure some of the more subtle relationships that exist.

Podsakoff et al.'s (1990) conceptualization of transformational leadership consisted of six transformational sub-dimensions derived from the research by Avolio and Bass (1988), Bass (1985), Bradford and Cohen (1984), Conger and Kanungo (1987), and House (1977), plus the transactional sub-dimension of contingent reward. However, even though the resultant TLI has demonstrated factorial, discriminant, and predictive validity (e.g., Podsakoff et al. 1996; Schriesheim, Castro, Zhou, & DeChurch, 2006), it has received surprisingly little subsequent attention in the research literature.

The current research involved an intervention study aimed at enhancing transformational leadership in an elite military training organization. Consequently, in line with the suggestions of Antonakis et al. (2003), it adopted a conceptualization of transformational leadership behaviors that provided greatest scope for fine tuning of the intervention, i.e., one that was fully differentiated. The measure used in the current study was based primarily on the TLI (Podsakoff et al., 1990). This was for two reasons: Firstly, one of the aims of the current research was to examine a fully differentiated conceptualization of transformational leadership that allowed for the effects of separate sub-dimensions to be analyzed. The TLI was designed with this in mind, and appeared to offer some promise (Podsakoff et al., 1990, 1996; Schriesheim et al., 2006). Secondly, having distinct constructs allowed for the fine tuning of the intervention.

The authors noted two minor weaknesses regarding the TLI as it relates to the context of the current research, i.e., to military recruit training. First, the vision construct in the TLI is not the most relevant in the current context because it, at least partially, assumes that the leader can alter the content of the vision from an organizational perspective. For example, an item from this construct “Is always seeking new opportunities for the organization” suggests that the leader has a degree of influence over the organization, the leaders that were examined in the current study were relatively low level and would not have, or would likely not be perceived as having, such influence. Bass and Avolio's (1995) conceptualization of inspirational motivation incorporates the articulation of an exciting vision, inspiring others with this vision, and also expressing that followers can achieve the vision. Recruit training is well known to be very physically and mentally demanding, so that the current authors felt that expressing the belief that followers could achieve the vision might be an important leadership behavior to measure. Indeed, previous studies that have assessed the effects of narrowly defined conceptualizations of vision have produced mixed empirical results (see, for example; Rafferty & Griffin, 2004). Consequently, the vision component in the TLI was replaced by a sub-dimension that was based on Bass and Avolio's (1995) conceptualization of inspirational motivation.

Second, the individual support dimension in the TLI was thought to be not the most relevant in the current context. This is because the measurement of individual support in the TLI is also relatively narrow and relates mainly to showing consideration of individual's feelings and needs, whereas the measurement of individual consideration in the MLQ 5-X (Bass & Avolio, 1995) contains two broad areas, namely, consideration of individual needs and also behaviors which are focused on follower development. It was felt that in a training environment, this latter aspect of individual consideration (with its focus on coaching and skill development) might be more relevant than a focus on individuals' feelings. Consequently, the individual support dimension from the TLI was replaced with a subscale that was based on Bass and Avolio's (1995) conceptualization of individual consideration.

The dimensions of transformational leadership included in the current study were: *Inspirational motivation* (Bass & Avolio, 1995) – developing and articulating a positive vision of the future, inspiring others to achieve that vision, and expressing belief that followers could achieve the vision; *Provides an appropriate role model* (Podsakoff et al., 1990) – behavior by the leader that sets an example for others to follow which is consistent with the values that the leader/organization espouses; *Fosters acceptance of group goals and team work* (Podsakoff et al., 1990) – behavior by the leader aimed at promoting cooperation among followers, getting them to work together towards a common goal, and developing teamwork; *High performance expectations* (Podsakoff et al.) – behavior by the leader that demonstrates his or her expectations for excellence in followers; *Intellectual stimulation* (Podsakoff et al.) – behavior by the leader that challenges followers to re-examine old problems in new ways; *Individual consideration* (Bass & Avolio 1995) – behavior by the leader that recognizes individual differences and demonstrates concern for the development of followers; and *Contingent reward* (Podsakoff et al., 1990) – provision of positive reinforcement to followers in return for appropriate follower behavior. Contingent reward was included because, although it is a transactional rather than a transformational behavior, it has been identified as an important predictor of group potency and performance in military settings (Bass et al., 2003).

Previous correlational research has shown that transformational leadership behaviors are positively related to a number of psychological outcomes in followers. These include organizational innovation (Jung et al., 2003), sports performance (Charbonneau, et al., 2001), self-efficacy and commitment (Rafferty & Griffin, 2004), satisfaction (Podsakoff et al., 1990), helping behaviors (Rafferty & Griffin, 2004) and group cohesion (Bass et al., 2003). Research has also identified some mediators of the relationship between transformational leadership behaviors and follower behaviors. These include intrinsic motivation (Charbonneau et al., 2001), trust (Jung & Avolio, 2000; Podsakoff et al., 1990), group potency (group confidence), and group cohesion (Bass et al., 2003). This research has provided an insight into certain mechanisms by which transformational leadership might exert an influence on follower behavior. However, in order to further asses the utility of transformational leadership there is a need to better understand: (a) which transformational leadership behaviors are most important in different contexts; (b) whether changes in leadership behaviors are possible; and (c) whether changes in leadership behaviors lead to psychological outcomes and behaviors in followers (Barling et al., 1996).

The first of these needs was addressed using a correlational panel design in Study 1. The second and third needs require some sort of intervention study. To the best of the current authors knowledge four field based experimental studies have examined the efficacy of transformational leadership interventions: Barling et al. (1996); Kelloway, Barling and Helleur (2000); Dvir et al. (2002); and Poppor et al. (1992). These studies are discussed in the introduction to Study 2. There remains a need to examine the effects of focused interventions on the specific behaviors that constitute transformational leadership, and concomitant effects on theoretically relevant follower variables.

The attitudes selected for examination in the current studies were: self-confidence; resilience; and satisfaction with training. A brief discussion of why these variables were included in the current study follows.

Self-confidence and self-efficacy have been shown to be an important determinant of performance in a number of settings, including business (e.g., Stajkovic & Luthans, 1998) and sport (e.g., Woodman & Hardy, 2003). Bass (1985) argued that one of the major goals of transformational leadership is to enhance followers' confidence by expressing belief in followers, encouraging followers to come up with their own ideas, delegating responsibilities, and setting high performance expectations of followers. Indeed, a substantial amount of correlational evidence has accumulated that generally supports this contention (e.g., Bass et al., 2003; Jung & Sosik, 2002; Rafferty & Griffin, 2004; Rafferty & Griffin, 2006; Shamir, Zakay, Breinin, & Popper, 1998). However, these studies have measured only a relatively narrow aspect of self-efficacy that relates to levels of expectation under normal conditions.

In the context of arduous military training, the present authors contended that absolute levels of recruits' self-confidence might not be so important as how much confidence was affected by setbacks and disconfirming experiences, i.e., the resilience of recruits. In his original conceptualization of self-efficacy, Bandura (1997) made a similar distinction between level and (what he called) strength of self-efficacy, although subsequent attempts to measure self-efficacy strength were seriously flawed so that findings in support of its apparent importance are irrelevant to the present study. In light of this distinction between absolute levels of confidence and resilience, the present authors chose to measure both variables.

One of the central tenets of transformational leadership is that it motivates groups and individuals to persist even when the conditions are unpredictable, difficult and stressful (Bass, 1985). Indeed, there is some research evidence that supports this notion, for example, Lim and Ployhart (2004) found that transformational leadership was more strongly related to performance in exceptional contexts than in typical contexts. It has been proposed that transformational leadership should have a positive effect on confidence and resilience by instilling a sense of optimism and collective efficacy in followers (Bass, 1998). The present authors would also contend that encouraging followers to adopt appropriate group goals and work collectively towards them might also reduce ambiguity by clarifying objectives. Similarly, leaders who role model the expectations placed upon followers in stressful circumstances may also serve to increase follower expectations of success when under pressure or after a setback.

In light of the above arguments, it was proposed that self-confidence and resilience would be positively related to training outcomes in Study 1, and would be positively influenced by the transformational leadership intervention in study 2.

A second central tenet of transformational leadership theory is that it will enhance followers' satisfaction (Avolio & Bass, 1988; Bass & Avolio, 1993) which has consistently demonstrated a positive relationship with job performance (e.g., Judge, Thorson, Bono, & Patton, 2001). Indeed, a substantial amount of correlational evidence has accumulated revealing strong positive links between transformational leadership and follower satisfaction (e.g., Dumdum, Lowe, & Avolio, 2002; Lowe et al., 1996; Podsakoff et al., 1990). Furthermore, Howell and Frost (1989) manipulated charismatic leader behaviors in a laboratory based study and showed corresponding increases in follower satisfaction with task. However, no published study has employed a field based intervention to test the effects of transformational leadership on job or task satisfaction.

Transformational leadership is theorized to impact follower satisfaction via the leader making their followers feel that they, and their contributions, are valued (Bass, 1985). It is thought that these effects are achieved by the leader being individually considerate, and providing followers with a meaning and purpose to their day to day work by inspiring them with an attractive vision. These processes seem to be particularly relevant in a training environment that is known to be both physically and mentally demanding on a daily basis. Consequently, it was proposed that satisfaction with training would be related to training outcome in Study 1, and would be positively impacted by the transformational leadership intervention in Study 2.

1. Study 1

1.1. Method

1.1.1. Participants

484 (mean age = 20.1 years, SD = 3.1 years) male, UK based, Royal Marine Commando recruits that were beyond week 4 in training took part in the Study. Royal Marine training is renowned as being one of the toughest training courses in the world. The training process involves transforming recruits' beliefs, attitudes, values and standards as well as developing their physical fitness and skills. The training is designed to take civilian recruits and transform them into Royal Marines that are mentally and physically able to operate to a very high standard in extremely hostile conditions. The breadth and scope of training is considerable and takes place in demanding environmental and personal conditions. There are a substantial number of compulsory assessments at different stages of training each of which needs to be passed in order to progress to the next stage of training. At the time of the study, training lasted for 30 weeks. However, this was the minimum time to pass out and it was not uncommon for recruits to take considerably longer to pass the course. Generally, training commences with approximately 40 recruits in each troop. However, as troops progress through training their sizes vary, generally decreasing due to attrition. Each troop has a training team assigned to them for the duration of training. The training team normally consists of 4 corporals (section commanders), a sergeant, and a lieutenant or captain. The section commanders directly lead a section of approximately 10 recruits. The 10 recruits and their section commander are kept together as much as possible for the duration of training.

1.1.2. Procedure

The research team consisted of civilian research staff. Data were collected from participants in intact troops in a variety of locations in order to fit in with the demands of training. These locations included classrooms, the troop's accommodation block, and in the field (e.g., at the rifle range). Civilian members of the research team were introduced to the recruits by a color sergeant who was not part of the recruits' training team. Recruits were briefed on the purpose and importance of the study, and the methods that would be used by the research team. A major focus of this brief was explaining that the data provided would be held in confidence and that no military personnel would see any completed questionnaires. It was also explained that anonymity would be maintained in the report writing stage of the research and that it would be impossible for anyone to identify individual recruits, trainers, or troops. Part of the confidentiality brief included a detailed explanation of why it was necessary to collect service numbers, i.e., in order that recruits' self-report data could be paired with their training outcome data. The recruits were then explicitly informed of the voluntary nature of the research, and were told that they did not have to fill out the questionnaires and could withdraw at any time. Informed consent was obtained and recruits were given the questionnaires to complete. When all the recruits had completed the questionnaires they were collected by a member of the research team and placed in an envelope, which was then sealed. The recruits were explicitly informed that the envelopes would only be opened by members of the research team once they had returned to the Institute of Naval Medicine.

Due to procedural limitations the self-report outcome measures were collected at the same time point as the leadership scales. This obviously raises the issue of common method variance, however, a different response format was used in the criterion variables than was used in the predictor variables, thus limiting the impact of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Furthermore, the main analyses in this study involved a training outcome that was assessed from a different source and therefore would not be affected by common method bias.

1.1.3. Measures

1.1.3.1. Leadership behaviors. The leadership measure used in the current study was based on TLI (Podsakoff et al., 1996) with some conceptual additions from the MLQ-5X (Bass & Avolio, 1995). 26 Items were selected based on how well they assessed the theoretical constructs highlighted in the introduction: inspirational motivation (Bass & Avolio, 1995); provides an appropriate role model (Podsakoff et al., 1990); fostering acceptance of group goals and team work (Podsakoff et al.); high performance expectations (Podsakoff et al.); intellectual stimulation (Podsakoff et al.); individual consideration (Bass & Avolio, 1995); and contingent reward (Podsakoff et al.). A 5-point Likert scale was used anchored by 1 = *not a tall*, 2 = *once in a while*, 3 = *sometimes*, 4 = *fairly often,* and 5 = *all of the time*. The leadership items are displayed in Table 1. Recruits were asked to fill out the questionnaire with their section commander in mind.

The factor structure of the scale was tested using confirmatory factor analyses (CFA) together with the following fit indices: Satorra–Bentler scaled chi square (χ^2); Root Mean Square Error of Approximation (RMSEA); Standardized Root Mean Square Residual (SRMR); Comparative Fit Index (CFI); and Non-Normed Fit Index (NNFI). The results indicated that the scale demonstrated an adequate factor structure (χ^2 (278) = 615.31; RMSEA = 0.05; SRMR = 0.06; CFI = 0.98; NNFI = 0.97). All the standardized factor loadings for each item on its designated factor were greater than 0.43, $p < .001$. Discriminant validity of the

Table 1
Standardized factor loadings for the leadership scales in Study 1.

Item	Inspirational motivation	Appropriate role model	Fosters group goals	Individual support	High per exp	Intellectual stimulation	Contingent reward
Inspirational motivation							
1 High standards… [a]	.49						
2 Talks optimistically… [a]	.43						
3 Expresses confidence… [a]	.63						
4 Talks enthusiastically… [a]	.67						
Appropriate role model							
1 Is a good role model for me to follow		.66					
2 Leads by example		.60					
3 Leads by "doing" rather than simply "telling"		.65					
Fosters acceptance of group goals							
1 Encourages recruits to be team players			.64				
2 Gets the section to work together for the same goal			.69				
3 Develops a team attitude and spirit among recruits			.75				
4 Believes each individual is crucial to the success of the section			.56				
Individual consideration							
1 Spends time… [a]				.59			
2 Treats as an individual… [a]				.52			
3 Considers that you have different strengths and abilities from others				.63			
4 Develop strengths… [a]				.73			
High performance expectations							
1 Insists on only the best performance					.54		
2 Will not settle for second best					.56		
3 Shows us that he expects a lot from us					.68		
4 Always emphasizes trying your best					.54		
Intellectual stimulation							
1 Asks questions that make me think						.65	
2 Gets me to rethink the way I do things						.56	
3 Challenges me to think about problems in new ways						.79	
Contingent reward							
1 Gives me special recognition when I do very good work							.79
2 Personally praises me when I do outstanding work							.86
3 Always gives me positive feedback when I perform well							.81
4 Recruits are given praise when they improve							.54

[a] These are word indicators only, not the complete MLQ items. The items were reproduced by special permission of the Publisher, MIND GARDEN, Inc. www.mingarden.com, from the "Multifactor Leadership Questionnaire for Research" by Bernard M. Bass and Bruce J. Avolio. Copyright 1995 by Bernard M. Bass and Bruce J. Avolio. All rights reserved. Further reproduction is prohibited without the Publisher's written consent.

separate leadership scales was assessed using competing models where the unconstrained (fully differentiated) model was compared to a series of models where the correlation between pairs of factors was constrained to 1.00. Anderson and Gerbing (1988) suggest that discriminant validity exists if the unconstrained models χ^2 value is significantly less than the constrained models. On all 21 of the resulting comparisons the unconstrained model had a lower χ^2, but on 2 of these models the χ^2 was not significantly lower. These "offending" models were for inspirational motivation paired with individual consideration, and inspirational motivation paired with fostering acceptance of group goals and teamwork. Despite two of the models demonstrating less than adequate discriminant validity, it was decided to retain the fully differentiated model.

It is important to note that although three of the Cronbach's alpha coefficients were above .70 and intellectual stimulation and appropriate role model were very close to it ($\alpha = .69$), high performance expectations ($\alpha = .66$) and inspirational motivation ($\alpha = .62$) were both low (see Table 3 for alpha coefficients). Having said that, it should be noted that Miller (1995) recommends that coefficient alpha should be viewed as a lower bound for internal-consistency because it tends to underestimate it, especially in scales with few items (Cortina, 1993). Single factor CFA results for high performance expectations and inspirational motivation were both satisfactory (χ^2 (2) = 3.23; RMSEA = 0.04; SRMR = 0.02; CFI = 0.99; NNFI = 0.98) and (χ^2 (2) = 5.54; RMSEA = 0.06; SRMR = 0.03; CFI = 0.99; NNFI = 0.96). Nevertheless, the results involving inspirational motivation and high performance expectations need to be interpreted with caution.

Given that one of the aims of the current research was to test the utility of conceptualizing transformational leadership as a set of distinct behaviors as opposed to a global construct, a global measure of transformational leadership was also created for the purpose of making this comparison. This measure was created by combining all the items measuring the transformational leader behaviors into one scale, i.e., the items from inspirational motivation, provides an appropriate role model, fostering acceptance of

group goals and team work, high performance expectations, intellectual stimulation, and individual consideration. The integrity of this scale was tested using a single factor CFA. The fit was inadequate (χ^2 (209) = 866.49; RMSEA = 0.09; SRMR = 0.08; CFI = 0.93; NNFI = 0.92), although the scale had a high alpha coefficient of .89. Coefficient alpha is known to be inflated by large numbers of items (Cortina, 1993).

1.1.3.2. Self-confidence. Self-confidence was operationalized as the confidence recruits had in meeting the challenges of training. Eight items were modified from Vealey's (1986) Trait Sport Confidence Inventory. The stem used for the self-confidence measure was, "compared to the most confident recruit you know, how would you rate your confidence in your ability to…". The response format was a 5-point Likert scale anchored at, 1 = *low*, through 3 = *medium*, to 5 = *high*. Because this scale was modified and has not previously been validated in a military context, CFA was again used to assess its factor structure. The results initially revealed an unacceptable factor structure. However, when three items were removed from the scale based on theoretical and empirical grounds, the resulting factor structure demonstrated a good fit (χ^2 (5) = 5.19; RMSEA = 0.01; SRMR = 0.02; CFI = 1.00; NNFI = 1.00). Coefficient alpha for this scale was .83 and all the factor loadings were >.61, p<.001. See Table 2 for a list of all the items, including deleted items.

1.1.3.3. Resilience. Resilience was operationalized as the ability to maintain confidence in the face of setbacks and disconfirming experiences. Six items were developed in line with the conceptualization discussed in the introduction. The stem and response format used was the same as for the self-confidence scale. Because this scale was developed specifically for this study the factor structure was examined using CFA. Initial CFA results revealed that the scale designed to tap resilience had an unacceptable factor structure. However, when two items were removed from the scale based on conceptual and empirical grounds, the resulting factor structure demonstrated a good fit (χ^2 (2) = 1.89; RMSEA = 0.00; SRMR = 0.01; CFI = 1.00; NNFI = 1.00). Coefficient alpha for this scale was .73 and all the factor loadings were >.60, p<.001. See Table 2 for all the items, including deleted items.

1.1.3.4. Satisfaction with training. Satisfaction with training was measured using five items adapted from Warr, Cook and Wall's (1979) job satisfaction scale. The response format was a 5-point Likert scale anchored at, 1 = *very dissatisfied*, 2 = *dissatisfied*, 3 = *neutral*, 4 = *satisfied*, and 5 = *very satisfied*. Because this scale was modified for the current study and had not been previously validated in a military context, the factor structure was examined using CFA. Initial CFA results revealed that the scale had an unacceptable factor structure. However, when one item was removed based on theoretical and empirical grounds, the resulting factor structure demonstrated a good fit (χ^2 (2) = 1.10; RMSEA = 0.00; SRMR = 0.02; CFI = 1.00; NNFI = 0.99). Cronbach alpha for the scale was .70 and all the factor loadings were >.51, p<.001. See Table 2 for all the items including deleted items.

Table 2
Standardized factor loadings for the recruit attitudinal scales.

Item		Self-confidence	Resilience	Satisfaction with training	Welfare support
Self-confidence					
1	Meet the challenges of training	.61			
2	Perform the technical tasks necessary to be successful (e.g., weapons handling, map reading)	.73			
3	Perform the field tasks necessary to be successful (e.g., field admin, section attacks)	.79			
4	To concentrate well enough to be successful	.65			
5	Perform under pressure	.78			
6	Perform the physical tasks necessary to be successful (e.g., gym work , speed marches)	D			
7	To make critical decisions during exercise	D			
8	To think and respond successfully during training	D			
Resilience					
1	Bounce back from performing poorly and succeed		.65		
2	Bounce back from a major injury and succeed		.60		
3	To adapt to different training situations and be successful		.77		
4	Be consistently successful week-on-week		.60		
5	Bounce back from back-trooping and succeed		D		
6	Be successful even when the odds are against you		D		
Satisfaction					
1	Your chances of progressing through training			.61	
2	The enjoyment you get from training			.65	
3	The quality of training you have received			.51	
4	Your decision to join the Royal Marines			.65	
5	The amount of work you are expected to do			D	

D = Item deleted.

1.1.3.5. Training outcome. Training outcome was defined as either successful completion of training (i.e., recruits passed out of training to serve in the Royal Marines) or withdrawal from training (i.e., all those that withdrew from training, either voluntarily or due to failure, but not including those that were discharged on medical grounds). Recruits that were "backtrooped" (i.e., temporarily removed from training and then inserted back into it in a later troop) due to injury or failure of a training phase were retained in the dataset. The withdrawal group therefore consisted of all those recruits that withdrew from training after week 5 for reasons other than medical discharge. The nature of the training environment is such that it is often difficult to differentiate between recruits that leave of their own volition, recruits that are forced out, and recruits that are expelled because of failure on course tests. For example, recruits that are consistently failing to reach the required standards are often advised to withdraw from training during the "open window" that exists for voluntary withdrawal.

Out of the 484 respondents, 350 comprised the training completion group and 122 comprised the training withdrawal group. The remaining 12 were either coded as medical discharge ($n = 12$). The mean age of the completion sample was 20.3 years (SD = 3.1) and the mean age of the withdrawal sample was 19.7 years (SD = 2.9), a 1-way ANOVA revealed that this difference approached, but did not reach significance $F(1, 471) = 3.38$, $p = .07$.

1.2. Results

Means, standard deviations, zero order correlations and alpha coefficients for all the scales measured in this study are displayed in Table 3. Inspection of the zero order correlations reveals that all the leadership behaviors were significantly related to all the outcome variables. The magnitude of the relationships between the different leader behaviors and the outcomes varied. For example, the relationship between fostering acceptance of group goals and satisfaction with training was $r = .45$ and the relationship between intellectual stimulation and satisfaction with training was $r = .19$.

Discriminant function analyses indicated that the leadership behaviors significantly discriminated between the "completion" and "withdrawal" groups χ^2 (7) = 22.36, $p = .002$. The standardized structure coefficients suggested that this discrimination was largely due to contingent reward ($r = .79$), fostering acceptance of group goals and team work ($r = .56$), appropriate role model ($r = .55$), inspirational motivation ($r = .45$) and individual consideration ($r = .42$). High performance expectations and intellectual stimulation did not make an important contribution to the discriminant function ($r < .40$).

The recruit attitudinal variables also significantly discriminated between the "completion" and "withdrawal" groups χ^2 (3) = 30.86, $p < .001$). The standardized structure coefficients suggested that all the attitudinal variables contributed to the discriminant function: resilience ($r = .86$); satisfaction ($r = .83$); and self-confidence level ($r = .57$).

In order to control for possible age effects (the age difference between completion and withdrawal samples approached significance ($p = .07$), two further discriminant function analyses were conducted with age included as a possible discriminating variable, one for the leadership behaviors and the other for the recruit attitudinal variables. Age did not make a substantial contribution to the discriminant function in either of these analyses ($r < .40$ in both cases), see Table 4 for details. The descriptive statistics for the "withdrawal" and "completion" groups together with the standardized structure coefficients for the different discriminant function analyses are also displayed in Table 4.

1.3. Discussion

The structural integrity of the multi-dimensional scale designed to measure transformational leadership was confirmed by CFA. The results indicated that all the transformational leader behaviors measured in this study, except for high performance expectations and intellectual stimulation, contributed to the discriminant function analyses. Interestingly, contingent reward was revealed to have the strongest relationship with training outcome. The recruit attitudinal variables significantly discriminated between pass and failure, resilience being the strongest contributor. The results of the single factor CFA performed on the global

Table 3
Means, standard deviations, zero order correlations between the Study 1 variables, with alpha coefficients are displayed on the diagonal. Alpha coefficients in parenthesis are for Study 2 sample.

Scale	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	
1. Inspirational motivation	4.03	0.60	0.62	(0.73)										
2. Appropriate role model	4.13	0.72	0.55**	0.69	(0.70)									
3. Fostering acceptance of group goals	4.04	0.67	0.66**	0.57**	0.74	(0.73)								
4. Individual consideration	3.82	0.78	0.61**	0.49**	0.63**	0.70	(0.75)							
5. High performance expectations	4.48	0.49	0.44**	0.40**	0.35**	0.27**	0.66	(0.78)						
6. Intellectual stimulation	3.65	0.67	0.43**	0.47**	0.41**	0.29**	0.32**	0.69	(0.70)					
7. Contingent reward	3.23	0.99	0.51**	0.43**	0.53**	0.54**	0.20**	0.37**	0.86	(0.77)				
8. Global TLB	4.03	0.49	0.81**	0.81**	0.82**	0.78**	0.58**	0.67**	0.60**	0.89	(0.92)			
9. Self-confidence	3.88	0.63	0.28**	0.22**	0.32**	0.24**	0.20**	0.14**	0.21**	0.32**	0.83	(0.86)		
10. Resilience	3.67	0.69	0.31**	0.19**	0.32**	0.21**	0.20**	0.15**	0.20**	0.29**	0.69**	0.73	(0.71)	
11. Satisfaction with training	4.10	0.58	0.35**	0.29**	0.45**	0.32**	0.21**	0.19**	0.31**	0.41**	0.46**	0.51**	0.70	(0.70)

$n = 484$, **$p < .01$.

Table 4
Means and standard deviations for "completion" and "withdrawal" samples, and structural coefficients for the discriminant function analyses Study 1.

	Completion	Withdrawal	Structural coefficients for the discriminant function	Structural coefficients for the discriminant function (with Age)
	Mean (SD)	Mean (SD)		
Leadership behaviors			$\chi^2(7)=22.36$*	$\chi^2(8)=24.47$*
Inspirational motivation	4.07 (0.58)	3.93 (0.67)	0.45	0.43
Appropriate role model	4.18 (0.68)	3.98 (0.82)	0.55	0.53
Acceptance of group goals	4.09 (0.62)	3.90 (0.75)	0.56	0.53
Individual consideration	3.87 (0.76)	3.70 (0.84)	0.42	0.40
High performance expectations	4.47 (0.50)	4.51 (0.46)	−0.20	−0.19
Intellectual stimulation	3.67 (0.64)	3.61 (0.73)	0.18	0.17
Contingent reward	3.36 (0.96)	2.97 (1.01)	0.79	0.76
Age	20.25 (3.10)	19.66 (2.95)	–	0.37
Self report variables			$\chi^2(3)=30.86$**	$\chi^2(4)=32.68$**
Self-confidence	3.94 (0.60)	3.69 (0.69)	0.57	0.56
Resilience	3.75 (0.67)	3.40 (0.70)	0.86	0.84
Satisfaction with training	4.16 (0.52)	3.88 (0.73)	0.83	0.81
Age	20.25 (3.1)	19.66 (2.9)	–	0.32

*p value for $\chi^2<.01$.
**p value for $\chi^2<.001$.
Completion sample $n=350$.
Withdrawal sample $n=122$.

measure of transformational leadership call into question the validity of such a conceptualization. Furthermore, the differential effects obtained for the different leadership behaviors in the discriminant function analysis also support a differential conceptualization of transformational leadership because a global measure would obscure the individual relationships that exist between the different leader behaviors and training outcome.

The finding that Intellectual stimulation and high performance expectations did not contribute to the training outcome was not hypothesized. However, an explanation for this may be that it is due to contextual differences. It is suggested that the intellectual component of intellectual stimulation may not be best suited to front line military personnel. Furthermore, this may have been exacerbated by the training context of this study, in which recruits were expected to learn a large number of new skills and new behaviors, often under quite severe time pressure. It is plausible that being expected to creatively problem solve whilst simultaneously learning new skills only serves to increase pressure and is therefore not helpful. This is an interesting proposition especially when taken in the context of other results pertaining to intellectual stimulation. For example, Podsakoff et al. (1990) found that intellectual stimulation was negatively related to trust and satisfaction, while Rafferty and Griffin (2004) found that intellectual stimulation was positively related to commitment. Podsakoff et al. explained their negative results by suggesting that intellectual stimulation may be associated with increased role ambiguity, conflict, and stress. Rafferty and Griffin (2004) explained their positive results by suggesting that intellectual stimulation may be interpreted by followers as an indication that their leader values their contribution, which may encourage them to increase their investment in the organization. Clearly, further research is warranted to explore these apparently conflicting findings.

The finding that high performance expectations did not discriminate between passing and failing in the current study may be primarily due to ceiling effects, the mean of high performance expectations was 4.48 on a 5 point scale. Of course, none of the subtleties discussed above are available when one uses a global measure of transformational leadership.

Contingent reward was expected to be a significant contributor to the discriminant function (pass/fail), but it was not hypothesized to be the strongest contributor. This finding suggests that in the context of recruit training contingent reward is perhaps more important in predicting behavioral outcomes than transformational leadership. In a military context (although their study was on trained soldiers), Bass et al. (2003) found that the correlation between contingent reward and performance was similar to that of their global measure of transformational leadership. Together these results suggest that contingent reward is at least as important a contributor to military performance as transformational leadership. This result is especially interesting when the means of all the separate leadership behaviors are examined. In the current study, and the Bass and colleagues study, contingent reward was the least used leader behavior reported.

There are a number of limitations with this study: (a) the scale designed to capture resilience was developed for the purpose of this study and as such needs further validation work before firm conclusions can be drawn about resilience. Nevertheless, resilience does appear to be a fruitful avenue for future research; (b) the low alpha coefficients particularly for inspirational motivation and high performance expectations are a cause for some concern and the results involving these variables need to be interpreted with caution; (c) only a small number of attitudinal variables were analyzed, there were no measures of interpersonal outcomes which have been suggested to be particularly important in stressful and arduous contexts (Lim & Ployhart, 2004).

In summary, the results of study 1 suggest that using a higher order global scale of transformational leadership would obscure important differences that exist between individual leadership behaviors and follower outcomes. They also suggest that the intervention in study 2 should focus on contingent reward, inspirational motivation, fostering acceptance of group goals and team work, appropriate role modeling, and individual consideration.

2. Study 2

To the best of the current authors knowledge there has been four field based intervention studies that have examined the effectiveness of a transformational leadership intervention: Barling et al. (1996); Kelloway et al. (2000); Dvir et al. (2002); and Poppor et al. (1992). Popper et al. conducted a transformational leadership training program on Israeli infantry cadets. Whilst Popper and colleagues argued that the transformational leadership training was successful one-item scales were used and no inferential statistics were reported that compared the effectiveness of the intervention with a control a group. Barling et al.'s study conducted a transformational leadership intervention on bank employees. Their results demonstrated that an intervention based on transformational leadership positively impacted followers perceptions of their leaders' transformational behaviors, followers' commitment, and follower performance. However, only three indices of transformational leadership behaviors were measured, and the sample size was relatively small for the financial (performance) outcomes measured ($n = 20$). In another study Kelloway et al. demonstrated that a transformational leadership intervention positively impacted followers' perceptions of their leaders' transformational behaviors. However, Kelloway et al. did not report any outcome data.

In a further intervention study, Dvir et al. (2002) demonstrated that a transformational leadership intervention positively enhanced follower perceptions of their leaders' behavior, and also led to increases in follower self-efficacy, critical independent approach, collectivistic orientation, and selected indices of performance (although the followers that reported higher levels of performance did not report corresponding increases in the attitudinal variables measured by Dvir et al.). However, whilst the Dvir et al. study provides clear evidence that a transformational leadership based intervention can enhance a variety of outcome variables, a global measure of transformational leadership was used. Thus, examination of which specific leadership behaviors were enhanced, and the nature of the relationship between these behaviors and specific outcome variables, was not possible. Study 2 aimed to bridge this gap in the literature.

It was hypothesized that the recruits in the group that received a transformational leadership intervention would report higher levels of inspirational motivation, appropriate role modeling, fostering acceptance of group goals, individual consideration and contingent reward by their direct leaders than recruits in a control group. It was also hypothesized that recruits in the intervention group would report correspondingly higher levels of the attitudinal variables when compared to the recruits in the non-intervention group. In light of the findings of Study 1, high performance expectations and intellectual stimulation were not part of the focus of the intervention and so they were not hypothesized to change as a result of it.

2.1. Method

2.1.1. General overview

The intervention in Study 2 consisted of the research team working one level removed from the trainers (section commanders) that delivered day to day training to recruits, and two levels removed from the recruits that received the training; i.e., the research team did not directly work with the section commanders but worked with other selected military personnel who in turn, after receiving training from the research team, trained the section commanders. Details of this training are described below.

Study 2 was a leadership intervention study, underpinned by transformational leadership theory that was designed to enhance leadership in a military training environment. The initial stage of the intervention involved a consultation process with senior military personal that led to the appointment of key influencers with whom the research team worked. These key influencers were two senior non-commissioned training officers (a Color Sergeant and a Warrant Officer 2nd class) who delivered the intervention, and a middle ranking commissioned officer (Royal Navy Lieutenant Commander) who provided "top cover" and liaised with senior management when necessary. This group of key influencers will hereafter be referred to as the coaching advisory team (CAT). The two non-commissioned officers were removed from normal military duties in order to deliver the intervention. The research team trained the two non-commissioned officers in transformational leadership theory and supported them in designing modules to train the section commanders that trained recruits.

The research team trained the CAT via a series of workshops and coaching sessions. The workshops consisted of a process that encouraged the CAT to take ownership of the project. This was done by working with a model of equal expertise in which the clients' expert knowledge in their area (military) was mapped onto the researchers' expert knowledge of transformational leadership theory. The process involved the research team coaching the CAT on the theoretical and applied aspects of transformational leadership theory and discussing when and how the different aspects of the theory might be applicable.

The intervention focused on the important leadership behaviors that were identified in Study 1 (fostering acceptance of group goals and team work, contingent reward, inspirational motivation, appropriate role model, and individual consideration). However, in order to simplify transformational leadership theory and make it more accessible to section commanders in the early stages of the intervention, a consultancy model was developed that discussed transformational leadership in terms of the provision of three basic components, *vision*, *support,* and *challenge*. Each of the separate transformational leader behaviors were then described as different ways in which vision, support, and challenge could be provided. For example, appropriate role modeling may be used to provide a vision (i.e., behaviors and characteristics of the leader that the follower wants to emulate), or support (i.e., the leader acting in a way that is consistent with the values they espouse), and even challenge (i.e., the followers' perception of their leaders' behaviors are so high that the followers may feel extremely challenged in trying to emulating them).

Given that the objective of the intervention was to enhance the use of transformational leadership behaviors by section commanders in a training (coaching) context, it was felt that it would be appropriate to help section commanders understand the use of the key leadership behaviors in four commonly occurring coaching activities: goal-setting; observation of behavior; giving

motivational and/or developmental feedback; and asking effective questions of recruits in order to enhance their engagement and ownership. Goal-setting could be viewed as an opportunity to help recruits to have a clear vision of what their training would lead to. It could also be viewed as an opportunity to challenge recruits to achieve higher or better standards. Observation and feedback could be thought of as opportunities to provide both support (via motivational feedback) and challenge (via developmental feedback). Effective questioning could be viewed as a skill that can help to engage followers in the process of generating their own vision and feedback, as well as helping them to take ownership of their training (i.e., have a clear vision of their training).

2.1.2. Design and sample

A random block design was employed to evaluate the effectiveness of the intervention. Recruits entered training at two week intervals. The first troop was assigned to the control condition, the second to the experimental condition, and so on. A total of six troops, three in the control condition and three in the experimental condition, with approximately 40 recruits in each troop took part in the study (recruit $n = 275$; troop $n = 6$). Each troop had a training team that worked exclusively with them. The training team consisted of a troop commander, a troop sergeant, and four or five section commanders (depending on the size of the troop). Of the 275 recruits that took part in the study, 152 recruits provided complete questionnaires for week 5 and week 15 of training (67 in the control condition and 85 in the experimental condition). Almost half the sample was lost from the study due to attrition between weeks 5 and 15. Whilst this is a large proportion of the sample to lose, at the time of the study, it was normal in Royal Marine recruit training for less than 50% of starting recruits to complete training. Failure to pass any of the mandatory tests results in recruits being re-assigned to another troop at an earlier stage of training, i.e., "back-trooping". Back-trooping can also occur because of injury. Recruits may also leave Royal Marine training, either voluntarily or via forced expulsion. Consequently, the 55% return rate was quite normal for this population. The mean age of the control group was 20.3 years (SD = 2.97 years) and the mean age of the experimental group was 19.5 years (SD = 2.29 years). This difference approached significance $F(1, 151) = 3.46$, $p = .07$.

2.1.3. Procedure

Troop trainers in the control condition received the normal recruit trainer training at the start of their tour of duty. The trainers in the experimental condition received the intervention detailed below in addition to their normal training. The CAT received training from the first and third authors based on transformational leadership theory and the four coaching skills discussed earlier. During the first six months of the study, the CAT were coached to enhance their knowledge of transformational leadership theory and their understanding of how to apply it to recruit training. The CAT then developed a three phase plan to provide training for the section commanders, troop sergeant, and troop commander of each experimental training team. Phase 1 was delivered to the training team while their troop was in foundation week one. During the (two week) foundation phase, training teams have only minimal contact with their troop. Phase 1 involved the CAT delivering a 1 day interactive workshop to the intact training team. The principle objectives of the workshop were to develop an understanding of: (a) what the trainers considered to be the ideal recruit, including a discussion of, and some basic training in, motivation and commitment; (b) discussion of recruit trainers' multiple roles and responsibilities; and (c) an introduction to the key principles underpinning the application of transformational leadership including the role of vision, support, and challenge, to the four basic coaching skills alluded to earlier.

Phase 2 involved the training teams receiving four half day workshops that focused on developing the four coaching skills identified earlier (observation, effective questioning, constructive feedback, and goal-setting). Within the workshops links were made to how these skills provided opportunities for recruit trainers to demonstrate the different leadership behaviors that were proposed to map onto vision, support, and challenge.

During Phase 3, the CAT provided *in field support* to section commanders to help them apply the knowledge they had acquired during phases one and two to their field setting.

The recruits in each condition were followed through the first 15 weeks of training (Phase 1). The allocation of successive troops to the experimental or control groups was alternated so as to limit the effects of confounding variables such as weather, quality of recruits, and media attention/information. The same questionnaire that was used in Study 1 was administered at training weeks 5 and 15 to assess the recruits' ratings of their section commanders' transformational leadership behaviors, and their own psychological status. The week 5 time point was chosen as it provided recruits with sufficient time to experience training and the leadership style of their instructor. The week 15 time point was chosen as it marked the mid-way milestone of training and the graduation of recruits from "basic" to more specialized training activities.

2.1.4. Measures

The questionnaire and administration procedures were the same as in Study 1. Because some of the alpha coefficients were less than optimal in Study 1, they were again tested with the Study 2 sample. All the alpha coefficients were $\geq .70$, See Table 3.

2.1.4.1. Analyses. While the intervention gave primary attention to the important leadership behaviors identified in Study 1 (i.e., the behaviors that contributed to the discriminant function analysis – fosters acceptance of group goals and team work, inspirational motivation, individual consideration, appropriate role model, and contingent reward), the other transformational leadership behaviors were also considered to be of at least secondary importance. Consequently, all the leadership behaviors were included in the analyses, but intellectual stimulation and high performance expectations were not expected to differ between the experimental and control groups.

The data were analyzed using separate two factor Group × Time analyses of variance with repeated measures on the second factor. Conducting multiple ANOVAs clearly increases the chances of making a type 1 error by capitalizing on chance, which it could be argued should be controlled for by either Bonferroni correcting the significance level used or running preliminary MANOVAs (one for the

leadership variables and one for the self report variables). However, the researchers took neither of these courses of action for three reasons: (a) we hypothesized that significant intervention effects would show up as *either* main effects *or* interactions. Such mixed effects might arise from the possibility that some transformational leadership behaviors might exert their effects on certain attitudinal variables early (and throughout) training, thereby producing main effects, whereas others may show effects only later in training and therefore yield interactions. Such mixed effects (e.g., two main effects and three interactions) could be "washed out" in a MANOVA by the non-significant variables in each effect; (b) clear directional a priori hypothesis were specified for each variable, and if such *patterns* of effects were repeatedly obtained for the hypothesized variables then they clearly could not have been obtained by chance, as chance effects would be random in direction; (c) it is only appropriate to use MANOVA if genuinely multi-dimensional hypotheses have been formulated, i.e., hypotheses about the combined linear effects of transformational leadership behaviors in the present study. The whole point of using a differentiated (as opposed to global) model of transformational leadership is that it is theoretically meaningless to consider linear combinations of the different leadership behaviors.

2.2. Results

The descriptives for the control and experimental groups are displayed in Table 5. The means in Table 5 demonstrate that there was a trend for scores to decrease across the period of the study for both groups (the week 5 scores are higher than the week 15 scores). However, in most cases the experimental group scores tended to be higher and/or decrease less across time than the control group scores.

The Group × Time ANOVAs indicated that a number of the Time effects mentioned above were significant (see Table 5). However, of more interest were the significant main effects for Group obtained for the leadership behaviors of individual consideration, $F(1, 150) = 8.56, p < .01$; fosters acceptance of group goals and team work, $F(1, 150) = 6.75, p < .01$; and contingent reward, ($F(1, 150) = 6.93, p < .01$. The main effect for inspirational motivation approached, but did not reach significance, $F(1, 150) = 2.76, p = .10$. Significant main effects for Group were also obtained for the recruit attitudinal variables of self-confidence $F(1, 149) = 4.23$, $p = .05$ and satisfaction with training, $F(1, 147) = 6.17, p = .02$. Finally, there was a significant Group × Time interaction for resilience $F(1, 149) = 7.23, p < .01$. Tukey's follow up tests revealed that the significant interaction was due resilience being greater for the experimental group at week 15 than the control group. All other interaction effects were non-significant. The *F*-values for all the leadership behaviors and attitudinal variables are displayed in Table 5.

Given that the experimental and control groups age difference approached significance ($p = .07$) all the above analyses were re-run using age as a covariate. This did not alter the significance of any of the findings, suggesting that age did not play a major role in the differences between the groups.

In order to examine whether using a global measure of transformational leadership in the analyses would yield different results than the analyses of the separate behaviors a follow up analyses using the global measure of transformational leadership was conducted. The results revealed that there was a significant main effect for group $F(1, 150) = 5.68$, $p = .02$, but no main effect for time $F(1, 150) = 1.14$, $p = .28$ and no Group × Time interaction $F(1, 150) = 0.01$, $p = .92$).

2.3. Discussion

The results demonstrated that an intervention based on a differentiated model of transformational leadership can positively impact a number of leadership behaviors and produce corresponding increases in follower attitudinal variables. More precisely,

Table 5
Descriptives and *F*-values for the 2 × 2 mixed model ANOVAs (Group × Time) of the Leadership Behaviors and Self Report Variables Study in 2.

Degrees of freedom in parenthesis	Control ($n = 67$)		Experimental ($n = 85$)		*F*-value for Group	*F*-value for Time (wk5 and wk15)	*F*-value for Interaction
	Wk5	Wk15	Wk5	Wk15			
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)			
Leadership behaviors							
Inspirational motivation (1,150)	4.11 (0.62)	4.08 (0.69)	4.29 (0.48)	4.19 (0.52)	2.76*	1.89	0.40
Appropriate role model (1,149)	4.37 (0.63)	4.22 (0.66)	4.41 (0.52)	4.36 (0.51)	1.33	3.32*	0.91
Acceptance of group goals (1,150)	4.12 (0.60)	4.03 (0.66)	4.37 (0.49)	4.21 (0.50)	6.75***	7.47***	0.55
Individual consideration (1,150)	3.96 (0.76)	3.82 (0.77)	4.23 (0.60)	4.11 (0.59)	8.56***	4.79**	0.28
H. performance expectations (1,150)	4.57 (0.49)	4.41 (0.63)	4.62 (0.46)	4.52 (0.46)	1.12	14.93***	0.64
Intellectual stimulation (1,150)	3.82 (0.59)	3.79 (0.62)	3.78 (0.61)	3.89 (0.56)	0.97	1.76	0.52
Contingent reward (1,150)	3.16 (0.90)	3.48 (0.78)	3.53 (0.79)	3.71 (0.76)	6.93***	13.39***	1.21
Global transformational leadership	4.02 (0.49)	3.98 (0.55)	4.18 (0.39)	4.14 (0.41)	5.68**	1.14	0.01
Recruit self report variables							
Self-confidence (1,149)	3.97 (0.63)	3.95 (0.59)	4.11 (0.46)	4.15 (0.50)	4.23**	0.52	0.47
Resilience (1,149)	3.81 (0.68)	3.62 (0.66)	3.81 (0.54)	3.90 (0.48)	2.79	0.91	7.23***
Satisfaction (1,147)	4.33 (0.43)	4.26 (0.52)	4.43 (0.38)	4.47 (0.39)	6.17**	0.46	2.01

*$p < .10$, **$p < .05$, ***$p < .01$.
F-value for Group tests the main effect between experimental and control groups.
F-value for Time tests the main effect from week 5 to week 15.

the results showed that three of the five leadership behaviors that discriminated between completion and withdrawal in Study 1 were significantly affected by the intervention whilst the effect on a fourth approached significance. All the attitudinal variables measured were significantly affected by the intervention. The fact that the different leadership behaviors were differentially affected by the intervention, lends weight to previous proposals that transformational leadership behaviors should be examined as separate factors (cf. Antonakis et al., 2003; Rafferty & Griffin, 2004). Such fine grained information could not be obtained or utilized from a global measure.

The results of Study 2 generally support and extend the findings of Dvir et al. (2002) and Barling et al. (1996). Dvir et al. showed that a global measure of transformational leadership could be positively impacted by an intervention in a military context. Barling et al. found that an intervention based on transformational leadership with bank employees increased subordinates ratings of their managers intellectual stimulation, charisma and individual consideration. Consistent with the Barling et al. study, the current study also demonstrated that individual consideration was enhanced. However, unlike the Barling et al. study, the current study did not impact intellectual stimulation. Intellectual stimulation was not a key predictor of training outcome in Study 1 and so was not a target of the present intervention. Furthermore, The academic component of this behavior may lend itself more to bank employees than front line military personal.

While the present study demonstrated that transformational leadership behaviors and certain attitudinal variables can be positively affected by an appropriate intervention, it is noteworthy that this study did not assess any behavioral outcomes in followers. Unfortunately, this was not possible in the present study for two reasons. First, the performance data that was available to the research team was largely categorical and fairly crude in nature rendering it insufficiently sensitive for the purposes of the study. Second, between week 15 and the completion of training a substantial number of participants and trainers moved sections, thereby producing at least two sources of confounding for any measure of training outcome.

2.4. General discussion

Studies 1 and 2 explored some of the measurement, predictive validity, and intervention issues associated with transformational leadership theory. The results generally supported and extended previous research with regard to the conceptualization and measurement of transformational leadership behaviors (e.g., Podsakoff et al., 1990; Schriesheim et al., 2006), the predictive properties of transformational leadership behaviors (e.g., Barling et al., 1996; Bass et al., 2003; Podsakoff et al., 1990), the utility of assessing the separate behaviors of transformational leadership (e.g., Antonakis et al., 2003; Rafferty and Griffin, 2004), and the efficacy of interventions based on transformational leadership theory (Barling et al., 1996; Dvir et al., 2002). Study 1 identified that all the leadership behaviors except intellectual stimulation and high performance expectations were important in discriminating between pass and failure of Royal Marine recruits. Study 2 revealed that fosters acceptance of group goals and team work, contingent reward, and individual consideration were significantly higher in the group that received the transformational leadership intervention. However, inspirational motivation was only marginally affected (if at all), and appropriate role model was not affected. A strength of the present study is that it utilized a combination of a correlational and experimental designs to identify key leadership variables in the context under consideration then examine the utility of a differentiated intervention for enhancing those aspects of leadership that were particularly pertinent to the situational context. Collectively, the results suggest that global measures of transformational leadership are very blunt instruments indeed.

Recently, there have been concerns raised about the impact of contextual influences on the validity of the theories surrounding transformational leadership (for a discussion see; Antonakis et al., 2003). The results of both Studies 1 and 2 support the notions that different transformational leadership behaviors might be important in different contexts, and that different transformational leadership behaviors can be differentially impacted by focused interventions (see the Discussions of both studies). In this regard, they provide a strong justification for future research to explore contextual influences on transformational leadership.

As discussed in the introduction, there is little consensus regarding the conceptualization of transformational leadership, with different researchers adopting different conceptualizations. The results from the current research lend some support to the recommendation of Antonakis et al. (2003) that authors retain a fuller factor structure when utilizing transformational leadership as the basis for an evaluation of key leadership behaviors with a view to subsequently trying to enhance the quality of leadership provided. The current studies also provided some preliminary evidence for the factor structure, predictive validity and discriminant validity of the measure used in the current study.

There are a number of limitations to the current studies. Mediational hypotheses were not directly assessed because the only performance data available to the research team was inadequate. The correlations between the leader behaviors and the attitudinal outcomes could not be accurately determined because potential common method effects were not adequately controlled for in the design of Study 1. The results obtained for inspirational motivation and high performance expectation in Study 1 have to be interpreted with caution because of the lower than desirable alpha coefficients. However, the alpha coefficients for all the leadership behaviors in Study 2 were greater than or equal to 0.70.

2.5. Conclusion

The present studies add to and extend the evidence that transformational and transactional leadership behaviors predict follower performance. The differentiated findings present support for previous calls to utilize more fully differentiated models of transformational leadership, and the intervention study adds to the evidence that transformational leadership behaviors can be enhanced by appropriate interventions. A number of areas worthy of future research have been highlighted, including contextual differences in the relative importance of different leadership behaviors, and further exploration of differentiated conceptualizations of transformational leadership.

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