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Running Head: TRANSFORMATIONAL LEADERSHIP INTERVENTION

Transformational Leadership: A Quasi-Experimental Study.

Key Words: Transformational Leadership, Intervention, Quasi-Experiment, Military, Group Cohesion.

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1 Abstract

2 *Purpose*

3 The current paper reports a field based quasi-experimental study designed to examine the
4 effectiveness of a transformational leadership intervention in remediating poor performance. The
5 intervention was conducted on elements of the organization that senior management perceived as
6 being low performing.

7 *Design*

8 A quasi-experimental pre-test post-design was employed to evaluate the effectiveness of
9 the transformational leadership intervention. Pre-test data was collected 4 months prior to the
10 intervention starting and the post-test data was collected 8 months after the intervention had
11 started. Follower perceptions of their leader's behavior and group cohesion, together with
12 training outcome data were used to evaluate the effectiveness of the intervention.

13 *Findings*

14 Results revealed that from pre-test to post-test changes in perceptions of leadership,
15 group cohesion, and training outcome indicated that the intervention had beneficial effects.
16 These beneficial effects were evidenced in one of two ways: desirable behaviors increased in the
17 experimental group from pre-test to post-test whilst they remained the same or were decreased in
18 the control group; or desirable behaviors remained the same in the experimental group whilst
19 they decreased in the control group.

20 *Originality*

21 The current study is the first to utilize a quasi-experimental organization wide design to
22 examine the efficacy of a transformational leadership intervention. Furthermore, this study
23 provides evidence that transformational leadership can buffer negative environmental effects.

1 Transformational leadership is one of the most widely used leadership theories in the
2 organizational psychology literature. Despite the considerable volume of research examining
3 transformational leadership only a small amount of this research has employed field based
4 experimental designs to examine transformational leadership interventions (e.g., Barling,
5 Webber, & Kelloway, 1996; Dvir, Eden, Avolio, & Shamir, 2002; Hardy et al., 2010; Kelloway,
6 Barling, & Helleur, 2000). This has led to many authors calling for researchers to utilize
7 experimental designs more in their transformational leadership research (e.g., Bass & Avolio,
8 1993; Jung & Avolio, 2000; Lim & Ployhart, 2004; Rafferty & Griffin, 2004). Indeed, in a recent
9 meta-analysis Dumdum, Lowe, and Avolio (2002) stated that “Any researcher going through the
10 coding exercise cannot help but be struck by the fact that there are still too few experimental
11 studies...” (p. 62). Using field based experimental designs when testing transformational
12 leadership theory is important because experimental designs have the potential to test for
13 causality in real world situations, can determine whether transformational leadership is
14 teachable, and can also quantify potential benefits to organizations. The present research used a
15 yearlong field based quasi-experimental design to examine the efficacy of an intervention
16 underpinned by transformational leadership theory on a group of poor performers in an infantry
17 training establishment.

18 In a transformational leadership intervention on bank employees, Barling et al. (1996)
19 demonstrated that certain indices of transformational leadership, organizational commitment, and
20 follower performance were positively affected by the intervention. This study provided an
21 important first step in field based research on transformational leadership interventions and
22 showed that a number of outcomes were positively impacted by the intervention. In a second
23 study, Dvir et al. (2002) implemented a transformational leadership intervention on Israeli

1 Defense Force army recruit training teams. The results extended the findings of Barling et al.
2 (1996) by including a greater range of outcome variables - extra effort, internalization of
3 organizational moral values, collectivistic orientation, critical-independent approach, active
4 engagement, self-efficacy, and performance. Dvir et al. also examined the different effects of
5 direct and indirect leaders. They found that direct leaders rated as displaying more
6 transformational behaviors enhanced attitudinal outcomes in their followers, but indirect leaders
7 affected performance. The Dvir et al. study provides clear evidence that an intervention
8 underpinned by transformational leadership can enhance a variety of outcome variables. Hardy et
9 al. (2010) examined the efficacy of a leadership intervention on military recruits using a
10 differentiated model of transformational leadership. Their results revealed that the intervention
11 significantly enhanced recruits' perceptions of the transformational behaviors targeted by the
12 intervention and also significantly enhanced a number of attitudinal outcomes. Mullen and
13 Kelloway (2009) extended the findings of the previous intervention studies by examining the
14 efficacy of providing safety-specific transformational leadership training compared to general
15 transformational leadership on safety related outcomes. The results revealed that the safety-
16 specific transformational leadership training positively enhanced leaders intentions to promote
17 safety climate, follower's perceptions of their leader's safety-specific transformational behaviors,
18 and reduced safety related events and injuries.

19 *Low Level Performers*

20 One of the key predictions of transformational leadership theory is that transformational
21 leaders stimulate followers to perform beyond expectations (c.f. Bass, 1985). The common
22 parlance in the transformational leadership literature appears to exclusively focus on high levels
23 of performance, with little explicit reference given to how transformational leaders may impact

1 low level performers. In formulations of transformational leadership there appears to be little
 2 mention of the potential for transformational leadership to remediate poor performance.
 3 Consequently, there is only limited understanding of, if and how, transformational leadership
 4 impacts upon low level performers. This is especially true in the experimental literature where
 5 control and experimental groups have been randomly assigned (e.g., Barling et al., 1996; Dvir et
 6 al., 2002; Hardy et al., 2010; Kelloway et al., 2000; Mullen & Kelloway, 2009) thereby ensuring
 7 parity between groups at pre-test.

8 Whilst the Barling et al. (1996), Dvir et al. (2002), Hardy et al. (2010), Kelloway et al.
 9 (2000), and Mullen and Kelloway (2009) studies provide strong evidence in support of their
 10 transformational leadership interventions, these studies did not specifically focus on low
 11 performing units, therefore inferences cannot be made regarding the impact that transformational
 12 leadership training has on remediating poor performance. From a theoretical perspective there is
 13 no reason to believe that transformational leadership training would be ineffective at remediating
 14 poor performers. Indeed, the supportive elements and coaching related components of
 15 transformational leadership (e.g., individual consideration and expressions of belief and
 16 confidence contained within the inspirational motivation subscale) may be particularly important
 17 in the remediation of poor performance. However, as mentioned earlier there is no empirical
 18 evidence that demonstrates transformational leadership training can remediate poor performance.
 19 Consequently, the first aim of the current study was to examine the effects that a
 20 transformational leadership intervention has on the poorer performing units of an organization.

21 *Turnover in Organizations*

22 A second issue that the present study addressed was long term versus short term effects.
 23 Barling et al. (1996) assigned different bank branches to either experimental or control groups

1 and followed these units for approximately five months. The Dvir et al. and Hardy et al., 2010
 2 studies assigned different training teams to either control or experimental conditions and
 3 examined them for the duration of one training cycle. Whilst, these studies have provided
 4 evidence that interventions can create a positive change in in-tact sub-units within organizations,
 5 there is no evidence to suggest that such interventions create organizational change that is
 6 sustainable under normal operating conditions that can include considerable turnover of staff.
 7 Most organizations will experience personnel turnover at all levels. It is therefore important to
 8 know whether transformational leadership intervention effects can be maintained in the face of
 9 such organizational turnover. By their very nature, the repeated measures designs used in
 10 previous studies can never answer this question. In other words, whilst these experimental
 11 studies had robust internal validities their external validity is not strong.

12 The authors felt that in order to further our understanding of transformational leadership
 13 training there was a need to utilize a different design to test the efficacy of interventions. Indeed,
 14 Grant and Wall (2009) have recently called on organizational psychology researchers to employ
 15 a greater range of methodologies, especially emphasizing quasi-experimental designs. The
 16 current study is a transformational leadership intervention, whereby leaders and followers across
 17 the whole organization were examined, the respondents at post-test were different to the
 18 respondents at pre- test, and the focal leaders changed over the period of the study in line with
 19 the normal operating conditions of that organization. A cross section of the whole organization
 20 was sampled before intervention work began with approximately half the organization, followed
 21 by another cross section of the entire organization one year later. One of the strengths of this
 22 design is that it captures changes in the organization under normal turnover conditions in a way
 23 that the repeated measure designs previously used in the literature cannot.

1 *Group Dynamics*

2 Despite transformational leadership being theorized to have its most important effects on
3 group dynamic type variables (e.g., Bass et al., 2003; Dvir et al., 2002; Judge, Bono, Ilies, &
4 Gerhardt, 2002), surprisingly little research attention has examined these types of outcomes (c.f.
5 Conger, 1999; Lim & Ployhart, 2004; Yukl, 1999). However, some recent correlational evidence
6 has supported the link between transformational leadership and group process outcomes (e.g.,
7 Bass et al., 2003; Callow et al., 2009; Lim & Ployhart, 2004; Schaubroeck, Lam, & Cha, 2007).
8 Furthermore, whilst Dvir et al. (2002) found that performance was enhanced by a
9 transformational leadership intervention no corresponding increases were observed in the
10 individual level psychological outcomes measured in their study. Consequently, the current
11 research will examine a group process variable that has been theorized to be impacted by
12 transformational leadership.

13 Carron, Widmeyer, and Brawley (1985) defined group task cohesion as the extent to
14 which team members identify with their team, and perceive their team to work effectively
15 together (Carron et al., 1985). Transformational leaders are suggested to impact group processes
16 by inspiring followers to transcend their own self-interest for the greater purpose or vision of the
17 group (Howell & Avolio, 1993). Group processes might also be impacted by transformational
18 leaders encouraging followers to adopt collective goals and by articulating belief in followers,
19 demonstrating concern for them, and encouraging teamwork (Podsakoff et al., 1990). Kark and
20 Shamir (2002) suggested that transformational leaders can move subordinates' focus from an
21 individual level to a group level by emphasizing the identity of the group, followers'
22 membership of the group, and by stressing the uniqueness of the group in comparison to other
23 groups. Consequently, the present researchers hypothesized that an intervention underpinned by

1 transformational leadership would have a positive effect on followers' perceptions of group task
2 cohesion.

3 Hypothesis 1. The transformational leadership training will increase followers'
4 perceptions of their direct leader's transformational behaviors when compared to the control
5 group.

6 Hypothesis 2. The transformational leadership intervention will positively impact
7 perceptions of group cohesion when compared to the control group.

8 Hypothesis 3. The transformational intervention will result in enhanced training
9 outcomes when compared to the control group.

10 Method

11 *Study Design*

12 Grant and Wall (2009) suggested that quasi-experimental designs are a vastly under-used
13 methodology in organizational research and that they can serve to strengthen causal inferences,
14 minimize ethical dilemmas, and foster constructive collaboration with practitioners. Quasi-
15 experimental designs are particularly useful under certain conditions, for example when
16 randomization to treatment condition is not possible or to take advantage of un-controllable
17 environmental events (c.f. Grant & Wall, 2009). The current study utilized a quasi-experimental
18 design in which randomization was not possible. Rather, based on the views of the organization's
19 senior management, low performing units were assigned to treatment condition whilst the other
20 half of the organization were used as a *control group*. The control group served as a measure of
21 external influences upon the organization for the duration of the study, thus protecting against
22 threats to internal validity such as maturation, history, and instrumentation (c.f. Campbell &
23 Stanley, 1963). Consequently, the extent to which treatment group changes differed in relation to

1 changes in the control group from pre-test to post-test was considered an indication of the
2 intervention effects; that is, intervention effects were evidenced by significant group x time
3 interactions. See Figure 1 for an overview of study design.

4 The intervention was evaluated using a pre-test post-test design. Recruit perceptions of
5 their leader's behavior and perceptions of group cohesion data were collected by taking a cross-
6 section of the entire organization in August 2005 (4 months before the intervention started, pre-
7 test) and another cross-section of the entire organization in August 2006 (8 months after the
8 intervention had started, post-test). The training outcome data was collected from July to October
9 2005 (pre-test) and July to October 2006 (post-test). These dates were selected because the
10 intervention started in January 2006 and, given that training takes 24-26 weeks, the earliest
11 possible time any intervention effects could be detected in terms of "first time" pass rates was
12 therefore July 2006 (24 weeks later). The time period of July to October constitutes a quarter of a
13 year and was thus considered long enough to enable a reliable assessment of pass/fail data to be
14 obtained. By collecting data at the same time of year in each year, the study also controlled for
15 time of year effects.

16 A strength of the study design was that it controlled for the effects of normal staff and
17 recruit turnover. More precisely, the design of the study was such that the units of analysis
18 (recruits) were different in the pre-test and the post-test. This was because training takes
19 approximately 24 weeks to complete, so that the recruits sampled in the pre-test (August 2005)
20 had left the training organization by the time of the post-test (August 2006). Furthermore, due to
21 the nature of the organization's tours of duty (personnel spend two years in any given post)
22 approximately 43% of the focal leaders in this study also changed between the pre-test and the
23 post-test. This is normal turnover for the organization, and the control and experimental groups

1 had similar turnover rates. Whilst, the recruit and leader turnover enabled us to examine the
2 effectiveness of a transformational leadership intervention in normal operating conditions, it also
3 introduced a potential threat to internal validity that relates to experimental mortality. For
4 example, it is possible that environmental factors could have differentially affected recruits
5 and/or staff in the experimental and control groups. This is indeed a serious issue and it is
6 discussed in more detail in the discussion section.

7 *Sample*

8 The current study was conducted in an Infantry recruit training establishment in the UK.
9 The Infantry recruit training process involves transforming recruits' beliefs, attitudes, values and
10 standards as well as developing their physical fitness and skills. The training is designed to take
11 civilian recruits and develop them into mentally and physically robust soldiers that are able to
12 operate to a very high standard in extremely hostile environments. There are a substantial
13 number of compulsory assessments that need to be passed in order to progress to the next stage
14 of training. At the time of the study, training lasted for either 24 or 26 weeks. However, these are
15 minimum time to pass out and it was not uncommon for recruits to take longer to pass the
16 course.

17 A total sample of 3973 recruits took part in this study. Participant self-report data was
18 provided by $n = 1457$ recruits (mean age = 19.31; SD = 2.42) and training outcome data was
19 provided by $n = 2516$ recruits (mean age = 19.42; SD = 2.47). The design of the study was such
20 that the vast majority of participants provided data only for the leadership and group cohesion, or
21 for the training outcome measure. However, 343 participants were common to all data sets; that
22 is, they provided, leadership, self-report, and training outcome data. The sampling window for
23 the training outcome data was 4 months long, and the leadership and attitudinal data were

1 collected midway into that window. Consequently, participants that were nearing the end of their
2 training when the leadership and attitudinal data were collected would also register training
3 outcome data point during this window. Participants that were not near the end of their training
4 period would not complete their training until after the leadership and attitudinal data collection
5 window had closed.

6 Four groups of recruits provided leadership and group cohesion data: experimental 2005
7 ($n = 403$; mean age = 19.09; SD = 2.39); control 2005 ($n = 253$; mean age = 18.83; SD = 2.43);
8 experimental 2006 ($n = 524$; mean age = 19.68; SD = 2.47); and control 2006 ($n = 277$; mean age
9 = 19.35; SD = 2.24). Four groups of recruits also provided the training outcome data:
10 experimental 2005 ($n = 820$; mean age = 19.47; SD = 2.47)¹; control 2005 ($n = 462$; mean age =
11 19.15; SD = 2.46); experimental 2006 ($n = 764$; mean age = 19.65; SD = 2.57); and control 2006
12 ($n = 470$; mean age = 19.23; SD = 2.25), please see Figure 1.

13 *Procedure*

14 Prior to the start of the intervention, a consultation process with senior military personal
15 led to the appointment of key military personnel with whom the research team worked. These
16 key personnel were four senior non-commissioned training officers (Warrant Officers 2nd Class)
17 who delivered the intervention, and one middle-ranking commissioned officer (a Major) who
18 provided “top cover”, liaised with senior management, and assisted in the delivery of the
19 intervention. This group of people will hereafter be referred to as the Training and Leadership
20 Advisory Team (TLAT). The TLAT were removed from normal military duties in order to
21 deliver the intervention. The research team trained the TLAT in transformational leadership
22 theory and supported them in designing modules to train the section commanders who then
23 trained recruits. The research team also helped the TLAT to adjust the modules for delivery to

1 more senior personnel in the chain of command. Each warrant officer was assigned to work with
2 one divisional company (there were 7 divisional companies in all, 4 in the experimental group
3 and 3 in the control group). The warrant officers were supported in this work by the Major and
4 the research team who provided auxiliary workshops to the chain of command as discussed in
5 the intervention section below.

6 *Intervention*

7 The research team trained the TLAT via a series of workshops and coaching sessions.
8 The workshops utilized a process that encouraged the TLAT to take ownership of the project.
9 This was achieved by working with a model of equal expertise in which the TLAT's expert
10 knowledge of their (military) area was mapped onto the researchers' expert knowledge of
11 transformational leadership theory. This process involved the research team coaching the TLAT
12 on the theoretical and applied aspects of transformational leadership theory and helping them to
13 identify when and how different transformational leadership behaviors might be utilized.

14 The TLAT and the authors also worked with the chain of command in the divisional
15 companies. This work took the form of a series of group and one to one coaching sessions that
16 were designed to complement the training that the platoon training teams received from the
17 TLAT.

18 Part of the current intervention made use of the vision, support, and challenge model of
19 transformational leadership described in Hardy et al. (2010). However, it is important to note
20 that at no point did the authors' use of this model supersede the fully differentiated model, it was
21 used only as a teaching aid whereby the different transformational leader behaviors were
22 described as ways in which vision, support, and challenge might be provided (for further details,
23 see Hardy et al. (2010).

1 The intervention group training teams received four half day interactive workshops from
2 the TLAT on: (1) transformational leadership; (2) vision, support, and challenge; (3) motivation;
3 and (4) coaching skills. The workshops were compulsory for the intervention group with all that
4 group's training teams receiving them. The intervention training teams also received on-going
5 support in the field on how to apply the principles of the workshops to their training context. The
6 control group training teams were offered the above workshops on request, but did not have the
7 option of on-going field support. The control group training teams made very limited use of the
8 optional workshops. It is important to note that high performance expectations was not focused
9 on in the intervention because the level of this behavior was already very high in the
10 organization.

11 *Measures*

12 *Leader Behaviors.* Recruits perceptions of their direct leader's behaviors (section
13 commanders) was measured using a leadership scale that was based on the Hardy et al. (2010)
14 measure which was in turn based on the Transformational Leadership Inventory (Podsakoff et
15 al., 1990) and the Multifactor Leadership Questionnaire (Bass & Avolio, 1995). This measure
16 was chosen because it allows for a contextually relevant differentiated conceptualization of
17 transformational leadership and has been shown to predict training performance in a British
18 military context (Hardy et al., 2010). Slight modifications were made to the item pool in order to
19 strengthen the measure. Of the original 26 items in the Hardy et al., scale, 9 items were modified
20 and a further 2 items were added. This resulted in a 28 item scale². The factor structure of the
21 modified scale was tested separately on both the 2005 and 2006 samples using confirmatory
22 factor analyses (CFA). The leadership scale demonstrated good factor structure in the 2005
23 sample ($S-B \chi^2 (329) = 612.03, p < .01$; RMSEA = 0.04; SRMR = 0.04; CFI = 0.99; NNFI =

1 0.99) and 2006 samples (S-B χ^2 (329) = 834.11, $p < .01$; RMSEA = 0.05; SRMR = 0.05; CFI =
2 0.99; NNFI = 0.98), although the S-B χ^2 was a little high in the 2006 sample. All the separate
3 scale alpha coefficients were greater than .70 expect for individual consideration in the 2006
4 sample which had an alpha coefficient of .66.

5 *Group cohesion.* Group task cohesion was operationalized as the extent to which the
6 recruit identified with their section, and perceived that their section worked well together as a
7 team. Four items were modified from Carron et al.'s (1985) group task cohesion to reflect the
8 military context of the current study. The response format was on a 5-point Likert scale ranging
9 from 1 (*strongly disagree*), 2 (*disagree*), 3 (*neutral*), 4 (*agree*), and 5 (*strongly agree*). The factor
10 structure of this scale for the 2005 sample was shown to be good (S-B χ^2 (2) = 3.68, $p = .16$;
11 RMSEA = .04; SRMR = .02; CFI = 1.00; NNFI = .99). However, the RMSEA was revealed to
12 be less than desirable in the 2006 sample (S-B χ^2 (2) = 17.88, $p < .01$; RMSEA = .10; SRMR =
13 .03; CFI = .97; NNFI = .92). The alpha coefficients for the scale were .79 and .76 for the 2005
14 and 2006 samples, respectively.

15 *Training Course Outcome.* Two indices of training outcome were used: 1) passed first
16 time relative to failed first time; and 2) previously failed recruits that subsequently passed
17 relative to previously failed recruits that subsequently failed. The intervention's effect on pass
18 rates was assessed by considering the relative pass rates of the control and experimental groups
19 during the three month period in 2005 (pre-test) and during the same three month period during
20 2006 (post-test). Comparing pre- and post-test pass rates in this way helped to control for
21 fluctuations in organizational factors (e.g., difficulties in recruitment, bad publicity, wars in the
22 Middle East and Afghanistan etc.) as such factors should affect both the control and the
23 experimental group in the same way. Another advantage of examining relative change in pass

1 rates was that it controlled for differences in first time pass levels that were known to exist; for
2 example, some of the divisional companies traditionally have a lower first time pass rate than
3 other divisional companies because their training is known to be more intense. Examination of
4 the changes in pass rates therefore provided a more accurate measure of the influence that the
5 intervention had on first time and other pass rates.

6 Results

7 *Leadership Behaviors*

8 A 2 (Group) x 2 (Year) fully randomized MANOVA on the leader behaviors indicated
9 that there were significant main effects for Group $F(7, 1447) = 6.01, p < .01, \text{partial } n^2 = .03$, and
10 year $F(7, 1447) = 10.20, p < .01, \text{partial } n^2 = .05$, together with a significant Group by Year
11 interaction $F(7, 1447) = 6.20, p < .01, \text{partial } n^2 = .03$. Since main effects are superseded by
12 significant interactions, only the multivariate interaction was followed up using univariate
13 ANOVAs. These follow up tests revealed significant interactions for inspirational motivation,
14 $F(1, 1453) = 18.22, p < .01, \text{partial } n^2 = .02$, appropriate role model, $F(1, 1453) = 9.69; p < .01,$
15 $\text{partial } n^2 = .01$, fostering acceptance of group goals, $F(1, 1453) = 14.42, p < .01, \text{partial } n^2 = .02$,
16 intellectual stimulation $F(1, 1453) = 6.94, p < .01, \text{partial } n^2 = .01$, and contingent reward $F(1,$
17 $1453) = 18.87, p < .01, \text{partial } n^2 = .01$, but no significant interaction for high performance
18 expectations $F(1,1453) = .01, p > .93, \text{partial } n^2 = .01$. The means, standard deviations, and F -
19 values for all the leadership behaviors are displayed in Table 2.

20 The separate univariate significant interactions were followed up using Bonferroni
21 corrected independent samples t-tests. The results suggested that the interactions for inspirational
22 motivation, appropriate role model, fostering acceptance of group goals, intellectual stimulation,
23 and contingent reward were due to the control group significantly decreasing from pre-test to

1 post-test, whilst the experimental group did not significantly change from pre-test to post-test;
2 and the interaction for individual consideration was due to the experimental group significantly
3 increasing from pre-test to post-test, whilst the control group did not significantly change from
4 pre-test to post-test.

5 The 2 x 2 randomized ANOVA on the follower perceptions of group task cohesion
6 indicated that there was no main effect for Group or Year but there was a significant Group by
7 Year interaction $F(1, 1378) = 16.03; p < .01$, partial $n^2 = .01$ (See Table 2 for means, standard
8 deviations, and F values). Bonferroni corrected independent samples t-tests suggested that the
9 interaction was caused by the experimental group significantly increasing from pre-test to post-
10 test, and the control group significantly decreasing from pre-test to post-test.

11 *Training Outcome*

12 Training Outcome 1 examined 1st time pass rates relative to 1st time failure rates, that is,
13 all those recruits that started and finished with the same platoon versus those recruits that started
14 but subsequently failed to complete with that platoon (having been either discharged or moved
15 into another platoon at an earlier stage in training; i.e., “back-squaded”). This statistic provides
16 an indication of the success rates platoons have in passing out recruits that start with them. First
17 time pass rate in the experimental divisional companies changed from 48.79% to 51.54%, an
18 increase of 2.75%, from 2005 to 2006. The control groups’ first time pass rate changed from
19 58.92% to 54.04%, a decrease of 4.88%, from 2005 to 2006. A chi square test of independence
20 indicated that the changes in 1st time pass rate relative to 1st time fail rate were significant ($\chi^2(1)$
21 = 5.86, $p < .05$). The results are displayed Table 3 and Figure 2.

22 Training Outcome 2 examined the returnees that passed out of training relative to the
23 returnees that were discharged from training during the four month data capture window.

1 Essentially, Training Outcome 2 assessed the ability of divisional companies to deal with recruits
2 that had been failed and returned into training at an earlier stage (been back-squadded). Returnee
3 pass rate in the experimental divisional companies changed from 36.36% to 55.26%, an increase
4 of 18.9%, from 2005 to 2006. The control groups' returnee pass rate changed from 50.94% to
5 55.22%, an increase of 4.28%, from 2005 to 2006. A χ^2 test of independence indicated that these
6 changes in returnee pass rates were significantly different for the experimental and control
7 groups ($\chi^2(1) = 18.09, p < .01$). The results are displayed Table 3 and Figure 3.

8 Discussion

9 The current study extends the transformational leadership literature by employing a
10 quasi-experimental design to evaluate the impact of a transformational leadership intervention in
11 remediating poor performance and the robustness of the intervention to organizational turnover.
12 Furthermore, circumstances that evolved during the course of the study enabled us to consider an
13 additional factor, namely, whether the transformational leadership intervention could prevent a
14 decline during more challenging environmental circumstances. That is, the country was engaged
15 in a war which was largely unpopular and the media tended to cover military behavior
16 unsympathetically. This may have negatively impacted recruitment and the training climate. It is
17 common knowledge in infantry training establishments that recruitment becomes increasingly
18 difficult in times of war, especially unpopular wars. Furthermore, the Ministry Of Defense
19 Annual Reports and Accounts (2005-06) reported that army recruiting was below target for
20 2005-06; this report suggested that "high employment, a prosperous and strong economy and
21 attractive alternatives in further education" (p.139) contributed to the difficult recruiting climate.
22 Interestingly, the previous year's recruitment and enlistment hit target and the following year the
23 Ministry of Defense Annual Reports and Accounts (2006-07) reported the infantry had increased

1 recruitment by 25%. This increase was attributed to specific recruitment targeting activities. The
2 apparent decline in organizational climate was offset by the transformational leadership
3 intervention (evidenced by the significant increases or no significant decline in the experimental
4 group). This finding is consistent with Dvir et al.'s (2002) recommendation that "...theoretical
5 formulations should incorporate the prevention of developmental regression as a positive
6 outcome of transformational leadership." (p. 742).

7 Of course when designing the current study we could not have known that the
8 organization would experience a decline in recruitment and training climate. However, this set of
9 circumstances allowed us to take advantage of environmental factors that are normally difficult
10 to study, such as negative events (c.f. Grant & Wall, 2009). Indeed, Grant and Wall (2009)
11 highlight that researchers have used opportunistic quasi-experimental designs to examine the
12 effects of naturally occurring events such as nuclear accidents (Chisholm, Kasl, & Eskenazi,
13 1983), and layoffs and demotions (Lieberman, 1956). During the course of the current study,
14 changes in the recruiting and training climate allowed us to examine an additional facet that has
15 received little empirical attention in the transformational leadership literature; that is, the extent
16 to which a transformational leadership intervention can protect against negative events (c.f. Dvir
17 et al., 2002). Indeed, the results of the current study indicate that a transformational leadership
18 intervention can prevent against a decline during negative events.

19 The current study adds to the growing body of literature that demonstrates the efficacy
20 of conducting transformational leadership interventions. However, an important contribution that
21 the current study makes beyond the previous studies lies in the sampling procedures adopted in
22 the current study. The Dvir et al. (2002) and Hardy et al. (2010) studies examined only a single
23 cohort of recruits as they passed through training. Whilst that design enables an examination of

1 whether specific training teams have been impacted from pre-test to post-test, it does not enable
2 conclusions to be drawn about the feasibility of organizational change. Since the sampling
3 procedure used in the current study examined a cross section of the entire organization at two
4 different time points between which there was considerable organizational turnover in both
5 leaders and recruits, the conclusions that can be drawn from it are importantly different to those
6 that can be drawn from the Dvir et al., and Hardy et al., studies. More precisely, the present
7 intervention has been shown to have an effect at an organizational level not just at the level of
8 specific training teams. This is an important addition to the literature because interventions have
9 generally examined the effects of transformational leadership in stable conditions where the
10 participants and leaders remain constant. However, the current intervention took place in a
11 dynamic context whereby normal organizational changes occurred to both the control and
12 experimental groups. This suggests that transformational leadership interventions can not only
13 affect less dynamic organizations where there is a small amount of turnover but can also affect
14 organizations where there is a relatively large turnover. This effect may, at least partially, be due
15 to the way in which the intervention was designed and delivered by individuals from within the
16 organization (key influencers). It may also have been influenced by the fact that the intervention
17 included on-going support to training teams and the chain of command on a regular basis.
18 Indeed, this aspect of the intervention may be a possible solution to the problem highlighted by
19 Kelloway and Barling (2000) that leadership training needs to incorporate a sustainable approach
20 that can be worked into leaders' daily routines. It is suggested that having an in house support
21 mechanism in the form of ongoing field support is one such system that may help to foster long
22 term sustainable change. Indeed, as a result of the current study the organization has imbedded

1 the Training and Leadership Advisory Team into the normal operating procedures of the
2 organization by creating new posts to fulfill these roles (as of 2012).

3 The results of the current study provide some quasi-experimental evidence that supports
4 previous correlational studies (e.g., Bass et al., 2003; Callow, Smith, Hardy, Arthur, & Hardy,
5 2009; Lim & Ployhart, 2004; Schaubroeck et al., 2007) that transformational leadership is
6 important in predicting group process variables such as group cohesion. It is somewhat
7 surprising, given that transformational leadership has been frequently theorized to have its most
8 important impact on group processes that, to the best of the current authors' knowledge, no field
9 based experimental study has directly tested this proposition. Whilst the current study did
10 attempted to examine a group process variable using a field based experimental design we only
11 used a relatively narrow aspect of group processes. Future experimental research should seek to
12 include a wider range of group processes such as, group potency, collective efficacy, and group
13 role variables.

14 At an applied level, one of the long term aims of the study was to embed within the
15 organization a group of key influencers who could support their colleagues in helping them to
16 become more transformational. The results suggest that embedding this kind of support
17 mechanism into the organization might benefit to the long term performance of the organization.
18 The financial benefits of this type of mechanism, given the increase in first time pass rates and
19 remedial pass rates, would appear to be highly beneficial to the organization. When the cost of
20 training recruits is factored against the cost of employing the key individuals the financial
21 benefits become starkly apparent. However, more research is clearly necessary to examine this
22 speculation.

23 *Limitations*

1 The current study sought to maximize external validity by trying to emulate normal
2 organizational operating procedures as closely as possible (i.e., the high rate of staff turnover in
3 the current organization). However, the process of maximizing external validity can sometimes
4 be at the expense of internal validity (Campbell & Stanley, 1963). For example, in the current
5 study organizational changes may have been different for the control and experimental groups
6 and it maybe these changes that could be an alternative explanation of the results. However,
7 there is no reason to believe that changes in the organization (e.g., placement of recruits, quality
8 of recruits, placement of trainers, resource allocation etc.) or changes in the wider environment
9 (e.g., negative publicity, unpopular wars, difficulties in recruiting) would have been different for
10 either of the groups over the course of the study. Indeed, when designing the study, we checked
11 with the senior management whether there were likely to be any changes to specific parts of the
12 organization that would impact the results. We also made checks during the study. It was the
13 opinion of the senior management, that whilst recruitment was becoming increasingly difficult,
14 these difficulties were apparent across the whole organization. The authors believe that the most
15 parsimonious explanation of the results remains that the observed differences in the experimental
16 and control groups for the duration of the study were as a result of the transformational
17 leadership training, none the less, we cannot rule out alternative explanations.

18 Theoretically, the observed effects in the current study could also have been caused by a
19 negative Hawthorne effect, as evidenced by the decrease in many of the control group variables.
20 That is, the control group performed more poorly because they thought the experimental group
21 was receiving special treatment. However, this is unlikely to be the case because the organization
22 under study ensures that employees at all levels frequently receive training courses in the context
23 of which the current study was probably perceived as being “just another training course.”

1 Interestingly, Dvir et al. (2002) noted a similar argument in their study (which was conducted in
2 a similar military context to the present study) regarding the fact that only the experimental
3 group received booster sessions in their study. Moreover, the control group training teams in the
4 present study were offered the workshops that the experimental group received, so they could
5 have had the same “special” treatment if they had wanted it. However, there was only a very
6 limited uptake of this offer. Thus, it is unlikely that the negative effects observed in the control
7 group were not negative Hawthorne effects, but were due to the wider organizational factors
8 discussed earlier, none the less we cannot rule out this possibility either.

9 In conclusion, with the above caveats in mind, the current study demonstrated that an
10 intervention underpinned by transformational leadership can positively impact the organizational
11 climate and organizational efficiency in a military setting. Furthermore, and of particular salience
12 to the current economic climate is the finding that transformational leadership interventions
13 appear to be able to enhance the performance of low performing groups and offset negative
14 changes in the organizational climate.

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Table 1.
Zero order correlations for all study variables (the 2005 sample is displayed on the left and 2006 sample is displayed on the right).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	-	.01	-.02	.07	-.01	.01	.04	.00	.01	.02
2. Week of Training	-.10	-	-.10**	-.01	-.13**	-.02	.01	-.11**	.00	-.01
3. Inspirational motivation	.00	-.04	-	.72**	.77**	.68**	.45**	.75**	.70**	.41**
4. Appropriate role modeling	.10*	-.03	.69**	-	.64**	.59**	.45**	.64**	.61**	.34**
5. Fostering acceptance of group goals	-.01	-.03	.73**	.63**	-	.62**	.47**	.67**	.60**	.39**
6. Individual consideration	.04	-.03	.66**	.57**	.59**	-	.31**	.63**	.64**	.35**
7. High performance expectations	.03	-.08	.37**	.41**	.39**	.22**	-	.33**	.24**	.23**
8. Intellectual Stimulation	.00	-.08*	.75**	.60**	.63**	.58**	.35**	-	.67**	.38**
9. Contingent Reward	.03	.07	.66**	.50**	.52**	.61**	.18**	.59**	-	.36**
10. Group Cohesion	-.02	-.02	.35**	.29**	.36**	.27**	.26**	.32**	.27**	-

Note. * $p < .05$; ** $p < .01$. 2005 sample n ranged from 643 – 656; 2006 sample n ranged from 751 – 801.

Table 2

Transformational Leadership Intervention

Means, standard deviations and F values for the fully randomized 2x2 MANOVA and the Univariate follow tests.

	Experimental		Control		Group	Year	Interaction	
	2005	2006	2005	2006			F value	F value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
MANOVA (df, 7, 1447)					6.01***	10.20***	6.20***	.03
Inspirational motivation	3.83 (0.77)	3.88 (0.75)	3.89 (0.76)	3.47 (0.86)	17.54***	17.93***	29.85***	.02
Appropriate role modeling	4.09 (0.76)	4.16 (0.73)	4.10 (0.76)	3.83 (0.83)	15.03***	5.73*	16.58***	.01
Fostering acceptance of group goals	4.18 (0.78)	4.18 (0.76)	4.26 (0.75)	3.85 (0.89)	7.81**	22.74***	23.27***	.02
Individual consideration	3.55 (0.90)	3.75 (0.94)	3.56 (0.90)	3.43 (0.90)	9.56**	0.80	10.48***	.01
High performance expectations	4.63 (0.51)	4.61 (0.51)	4.45 (0.59)	4.44 (0.65)	32.02***	0.23	0.01	.00
Intellectual Stimulation	3.70 (0.82)	3.64 (0.78)	3.73 (0.83)	3.38 (0.84)	6.70**	21.95***	10.56***	.01
Contingent Reward	3.34 (1.01)	3.39 (0.96)	3.49 (1.05)	3.07 (1.04)	2.22	11.95***	18.57***	.01
Group Cohesion	3.70 (0.84)	3.86 (0.73)	3.84 (0.81)	3.64 (0.81)	0.71	0.14	16.06***	.01

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3
Displays the chi square analyses for the training outcomes

	July to Oct 2005		July to Oct 2006	
	Experimental	Control	Experimental	Control
Passed 1 st Time	325	241	335	214
Did not Pass 1 st Time	341	168	315	182
Total Pass	381	268	398	251
Total Fail	439	194	366	219
Returnees that Passed	56	27	63	37
Returnees that Failed	98	26	51	30
Training outcome 1	Passed 1 st time relative to Did not pass 1 st time		$\chi^2(1) = 5.86; p < .05$	
Training outcome 2	Returnees passed relative to Returnees failed		$\chi^2(1) = 18.09; p < .01$	

The chi square analyses calculated the expected values for 2006 based on the 2005 data.

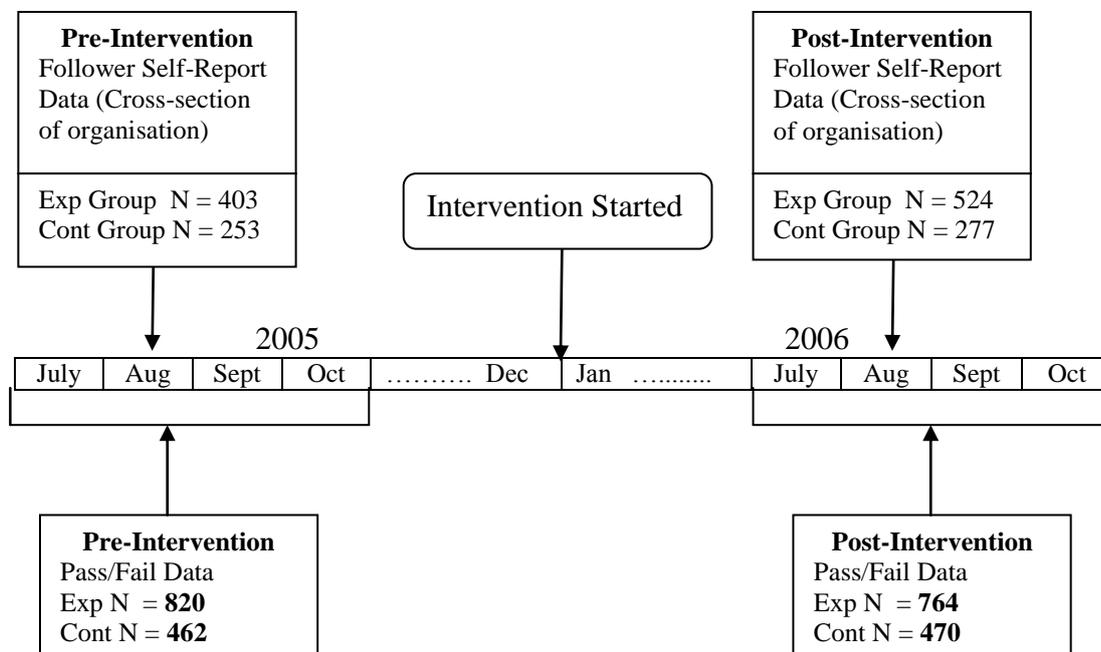


Figure 1. Overview of Study Design

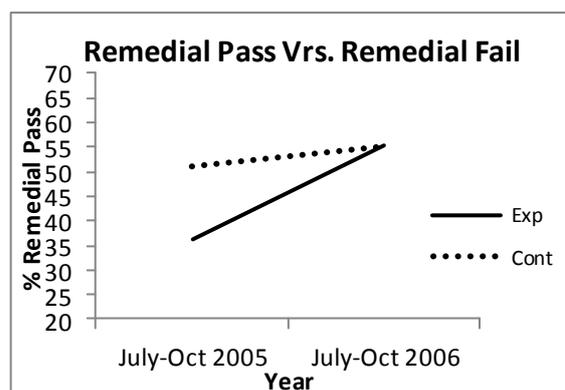
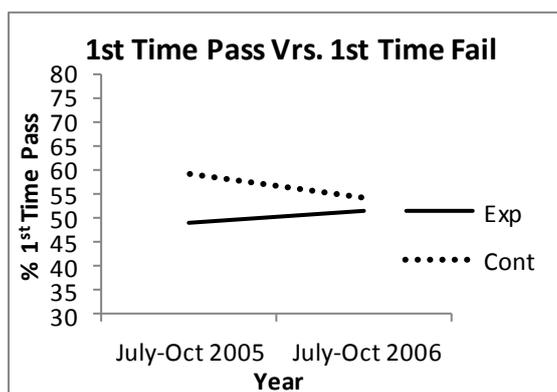


Figure 2

Figure 1 shows the 1st time pass vs. 1st time fail data for the experimental and control groups from 2005 to 2006, i.e., all those recruits that successfully completed training with the platoon they started with, vs. the recruits that were failed out of the platoon that they started with during the data capture window.

N.B. Different divisional companies have traditionally different pass rates, therefore the result of interest is the change in pass rates rather than absolute level of pass rate.

Figure 3

Figure 3 shows the remedial pass rate vs. the remedial fail rate of the experimental and control groups from 2005 to 2006, i.e., all the recruits that were on remedial training that passed relative to all the recruits that were on remedial training that failed during the data capture window. This figure displays the efficacy of the divisional companies at passing recruits who are on remedial training.

Footnotes.

1. Three platoons did not have age data (N = 133).

2. Please note that three items used in this scale are from the MLQ and two have been slightly modified from items in the MLQ. All five items were reproduced by special permission of the Publisher, MIND GARDEN, Inc. www.mindgarden.com, from the “Multifactor Leadership Questionnaire for Research” by Bernard M. Bass and Bruce J. Avolio. Copyright 1995 by Bernard M. Bass and Bruce Avolio.