



The effects of leadership style on stress outcomes

Joseph B. Lyons^{a,*}, Tamera R. Schneider^b

^a Air Force Research Laboratory, United States

^b Wright State University, United States

ARTICLE INFO

Keywords:

Transformational leadership
Stress appraisals
Self-efficacy
Emotions
Social support

ABSTRACT

The present study manipulated transformational and transactional leadership styles to examine their influence on individuals' performance on a stressful task, and on perceived social support, self-efficacy beliefs, emotions, and stressor appraisals. In addition, this study examined whether these variables mediated the relationship between leadership style and performance. Two hundred fourteen participants viewed video instructions for a stressful task presented by an actor depicting one of three leadership styles (transformational, transactional-contingent reward, and transactional-management by exception). Participants' psychological, emotional, and motivational responses to the videos were assessed prior to their engagement with the task. The transformational leadership condition was associated with enhanced task performance, higher social support perceptions, greater efficacy beliefs, lower negative affect, and lower threat appraisals compared to the transactional conditions. Causal modeling revealed that leadership style had a direct, rather than indirect, effect on task performance. The present research extends leadership research by providing an experimental evaluation of the costs/benefits of transformational and transactional leadership under stressful task conditions. Some of the results parallel those from correlational field studies, thus corroborating transformational leadership theory while other results diverge from theory, but present opportunities for future research.

Published by Elsevier Inc.

1. Introduction

Highly complex and stress-laden workplaces present challenges to organizational leaders as they are faced with the task of managing the workforce while concurrently maintaining commitment and morale. Leaders themselves can often be a central source of stress among employees (Basch & Fisher, 2000; Offermann & Hellmann, 1996; Sosik & Godshalk, 2000). As the characteristics of work change, so must the roles and tactics of modern leaders. Leaders who promote supportive relationships, elicit motivation among subordinates, facilitate more positive and less negative emotions among subordinates, and engender more benign evaluations of stressful tasks among subordinates may be more effective than the more traditional leaders who tend toward task-directive techniques. These relational, motivational, and emotional leadership elements are consistent with transformational leadership styles (Bass, 1998; Yukl, 1998). Despite a substantial body of literature which suggests that transformational leaders are effective, there is a paucity of experimental research that has explored how transformational leaders impact subordinates during stressful transactions. The present study manipulated transformational and transactional leadership styles to examine their influence on a variety of subordinate outcomes including emotional and motivational experiences, as well as objective task performance on a stress-laden task. Further, these variables were examined as potential mediators of the effects of leadership style on stressful task performance.

* Corresponding Author. Air Force Research Laboratory, Logistics Readiness Branch (AFRL/RHAL), 2698 G Street, Bldg 190, Wright-Patterson AFB, OH 45433-7604, United States. Tel.: +1 937 255 3771; fax: +1 937 255 4250.

E-mail address: joseph.lyons@wpafb.af.mil (J.B. Lyons).

Bass's (1998) Full Range of Leadership Model discusses three leadership styles: transactional, laissez-faire,¹ and transformational. A fundamental aspect of transactional leadership is the social exchange process. There are three forms of transactional leadership: contingent reward, management by exception-active, and management by exception-passive. Contingent reward leadership involves establishing employee expectancies of rewards (e.g., financial remuneration or public praise) for good performance. Management by exception-active leadership is characterized by actively monitoring subordinate deviations from performance standards. These leaders motivate subordinates by encouraging them to maintain established performance standards and avoid making mistakes. When performance deviations are detected, the leader will intervene and make the necessary corrections. In contrast to the active form, passive management by exception leaders do not actively monitor performance deviations but rather wait to be notified of performance deviations. Then upon recognition of a performance deviation, the leader will intervene. The present research focuses only on the active form of management by exception, and all future references to management by exception leadership are in reference to the active form of management by exception.

In contrast to transactional leaders, transformational leaders appeal to the motivational, emotional, and developmental needs of their subordinates (Bass, 1998). Transformational leadership is characterized by four elements: inspirational motivation (the ability to naturally motivate and appeal to others' emotions), idealized influence (the ability to elicit respect from others), individualized support (the ability to support subordinates' unique developmental needs), and intellectual stimulation (the ability to stimulate subordinates' desire to learn and develop) (Bass, 1998). Transformational leaders empower employees through emotional appeals (Yukl, 1998) and may reframe stressful situations as opportunities for growth while providing the necessary support throughout the performance process (Bass, 1998; Sosik & Godshalk, 2000). Research has demonstrated that transformational leaders are effective leaders (Lowe, Kroeck, & Sivasubramaniam, 1996; Podsakoff, Mackenzie & Bommer, 1996; Yammarino, Spangler & Bass, 1993). However, most leadership research has used correlation data to examine how certain leadership styles relate to performance and other subordinate variables, consequently numerous researchers have called for increased use of experimentation in leadership research (Brown & Lord, 1999; Kirkpatrick & Locke, 1996). There are some empirical studies in which leadership styles (notably charismatic styles) have been manipulated (Cherulnik, Donley, Wiewel, & Miller, 2001; Bono & Ilies, 2006), yet few studies have examined whether these manipulations result in changes in objective task performance. Due to their superior visioning, support, and potential for reframing of stressful situations as opportunities, it is expected that transformational leaders will enhance subordinate's task performance during stressful tasks.

Hypothesis 1. Individuals exposed to a transformational leader will perform a stressful task better than individuals exposed to a transactional leader.

Given the complexities of modern work and the inextricable influence of leaders in the workplace, a variety of subordinate outcomes should be considered in leadership research. Stress-related variables may be pertinent given the increasingly harsh demands under which modern-day workers must perform. The stress process involves a multitude of influential factors, some of which are elements of the situation, while others are individual characteristics that influence reactions to situations (Lazarus & Folkman, 1984). The present study is concerned with the costs and benefits of different leadership styles. Consequently, we focused on stress-related variables that may be influenced by leadership styles, including: social support perceptions, efficacy beliefs, emotions, and stressor appraisals.

Social support can be considered one aspect of the repertoire of resources that individuals may have access to in order to cope with stress (Hobfoll, 1998). Social support encompasses a variety of dimensions including: emotional, informational, and instrumental support (see Cohen & Wills, 1985). Transformational leaders are thought to provide the necessary support to subordinates while attending to subordinates' unique developmental needs (Bass, 1998). Past field research has shown that transformational leaders are perceived as being more supportive of their subordinates compared to other leadership styles (Podsakoff, Mackenzie, Moorman, & Fetter, 1990), yet this relationship has not been tested in a laboratory setting.

Hypothesis 2. Individuals exposed to a transformational leader during a stressful task will report greater social support than individuals exposed to a transactional leader.

In addition to social support perceptions, leaders are also likely to influence individuals' confidence perceptions in task situations, also known as self-efficacy. Self-efficacy represents an individual's perception of being agentic, in a general sense (Bandura, 1997). Transformational leaders likely have a positive influence on individuals' task-specific self-efficacy beliefs, which are malleable compared to the trait-like self-efficacy perceptions (Chen, Gully, Whiteman, & Kilcullen, 2000). Transformational leaders are believed to increase subordinates' effort-performance expectancies, and thus should facilitate subordinates' beliefs they will achieve existing goals (Shamir, House, & Arthur, 1993). In accordance, past research has linked transformational leadership to the development of collective efficacy among teams (Walumbwa, Wang, Lawler, & Shi, 2004).

Hypothesis 3. Individuals exposed to a transformational leader during a stressful task will report higher task-specific self-efficacy beliefs than individuals exposed to a transactional leader.

¹ Laissez-faire leadership is discussed in the Full Range of Leadership model but it represents the absence of leadership and is therefore not discussed further in the present research.

While transformational leaders are believed to influence subordinates' efficacy perceptions, they are also thought to interact with subordinates on an emotional level (George, 2000). Research examining subordinate attitudes has shown that transformational leadership is related to higher subordinate-rated satisfaction (Podsakoff et al., 1996) and optimism, and to lower frustration (McColl-Kennedy & Anderson, 2002). Individuals experience emotions on a continuous basis as new situations are encountered and evaluated (Lazarus, 1999). As employees experience routine and novel events, leaders may shape their emotions through processes such as emotional contagion. Emotional contagion occurs when individuals reciprocate the emotions that they observe in those around them (Hatfield, Cacioppo, & Rapson, 1994).

The emotional contagion hypothesis has been substantiated by past research. Researchers have found that that has charismatic/transformational leadership generates positive emotions among subordinates in laboratory settings (Bono & Ilies, 2006; Cherulnik et al., 2001) as well as in work settings (Bono, Foldes, Vinson, & Muros, 2007). For example, Bono and Ilies (2006) conducted a series of studies to show that charismatic leaders express more positive emotion (in vision statements and in video presentations). In another study, participants were assigned to videotapes coded as high or low in positive leader expression. Participants exposed to leaders high in positive emotion expression reported more positive affect than those exposed to leaders low in positive emotion expression. Similarly, participants exposed to positive emotion leader expression compared to a neutral expression condition reported higher positive affect. These results show that participant-followers perceive differences in emotional expression in leaders, and that these perceptions evoke differences in reports of positive affect. While emotional contagion appeared to occur during passive exposure, it is currently unclear whether subordinates benefit from emotional contagion during demanding task situations. Additionally, experimental research has yet to examine the effects of transformational leadership on the experience of negative emotions. Plausibly, the inspirational and supportive nature of transformational leaders may foster positive emotions while inhibiting negative emotions among subordinates, relative to other leaders. In fact, when employees are asked to describe what makes them feel positive and negative at work, they report that organizational leaders can be a source of both positive and negative emotions (Basch & Fisher, 2000).

Hypothesis 4a. Individuals exposed to a transformational leader during a stressful task will experience a smaller stress-related decrease in positive affect compared to individuals exposed to a transactional leader.

Hypothesis 4b. Individuals exposed to a transformational leader during a stressful task will experience a smaller stress-related increase in negative affect compared to individuals exposed to a transactional leader.

While leaders may shape subordinate emotions, they might also influence how subordinates evaluate stressful work tasks. Given an impending stressor, stress appraisals depend on evaluations of situational demands in relation to available resources (Lazarus & Folkman, 1984). The outcomes of this appraisal process can be either challenge appraisals (approach-oriented responses) where demands are evaluated as commensurate with resources, or threat appraisals (avoidance-oriented responses) where stressor demands are deemed as outweighing available resources (Blascovich & Tomaka, 1996; Schneider, 2004). Transformational leaders will likely influence subordinates' stress appraisals because of the support, encouragement, and emotional involvement that characterize their daily interactions with employees. Subordinates tend to report lower stress levels when leaders use encouraging and delegating (empowerment) behaviors compared to controlling behaviors (Offermann & Hellmann, 1996). Research by Sosik and Godshalk (2000) corroborates this claim by demonstrating that protégés of mentors exhibiting transformational leadership behaviors (e.g., an empowerment-based style) report less distress than individuals under mentors who exhibit transactional or laissez-faire behaviors.

Hypothesis 5. Individuals exposed to a transformational leader will report less threatening appraisals of an impending stressor compared to individuals exposed to a transactional leader.

To date, little is known about the mechanisms through which transformational leaders influence subordinate performance. Transformational leadership theory postulates that these leaders enhance subordinate performance by appealing to subordinate emotions (George, 2000), enhancing effort-performance expectancies (Shamir et al., 1993), supporting subordinates, and re-framing work demands as opportunities for growth (Bass, 1998). The previous section discussed past research linking transformational leadership with social support, task-specific self-efficacy, state affect, and stress appraisals. The following section briefly discusses how these variables, in turn, may be associated with enhanced performance.

There is substantial empirical evidence demonstrating that heightened threat appraisals are related to performance decrements. Stress appraisals predict performance on stressful tasks such as mental math (Schneider, 2004; Tomaka, Blascovich, Kelsey, & Leitten, 1993), giving a videotaped speech (Lyons & Schneider, 2005), and even training on a complex task (Gildea, Schneider, & Shebilske, 2007). These studies demonstrate that threat appraisals predict poor performance on an impending task, relative to challenge appraisals. Self-efficacy, social support, and emotions are also related to performance. Individuals with high self-efficacy tend to set higher goals and perform better than individuals with low self-efficacy perceptions (Phillips & Gully, 1997). Self-efficacy has been well-researched and is linked to enhanced performance in a variety of domains (Bandura, 1997). Social support can also enhance performance in both leadership (Erdogan & Enders, 2007) and laboratory settings (Sarason & Sarason, 1986). Finally, past research has linked emotions, primarily positive emotions, with enhanced performance (Erez & Isen, 2002; Isen, Daubman, & Nowicki, 1987).

Hypothesis 6. The relationship between leadership style and task performance of a stressor will be indirect, operating through the impact of leadership style on social support, task-specific self-efficacy, emotions, and stressor appraisals.

In summary, the purpose of the present study was two-fold. First, the authors sought to expand upon past experimental research by exploring how laboratory manipulations of transformational leadership influence task performance during a stressful task, social support perceptions, efficacy beliefs, positive and negative emotions, and stressor appraisals. Second, the authors examined a theoretically-based mediation model which posited that the effects of transformational leadership on task performance would indirectly operate through social support, efficacy, emotions, and stressor appraisals.

2. Method

2.1. Participants

Participants ($N=214$) from a midwestern university participated in this study. The average age was 20 ($SD=4$) and ranged from 17 to 45. The majority of participants were female (71%) and most were Caucasian (66%), followed by African American (26%).

2.2. Stimuli: Leadership style manipulations

Digitally-recorded instruction sets were created for three leadership conditions: transformational (TF), transactional-contingent reward (TA-CR), and transactional-management by exception (TA-MBE). The instructions were presented to participants on a computer monitor. A male actor served as the leader in all instructional sets.² In all videos the male actor was introduced as the laboratory director and the actor gave the participants task instructions to simulate a leader–subordinate relationship.

2.2.1. Transformational instructions

Transformational leadership was conceptualized by generating charisma (idealized influence and inspirational motivation), communicating individualized support (individualized consideration), and promoting learning and creativity (intellectual stimulation) (Bass, 1998). Examples from the instructions are provided in parentheses. Consistent with past research on charismatic leadership (Awamleh & Gardner, 1999; Hunt, Boal, & Dodge, 1999) the transformational scripts contained visionary behavior (“You might view this task as a challenge you can master”), high performance standards and confidence in the students’ ability (“I believe you can perform well, because only motivated and exceptional people pursue college degrees”), references to past successes (“This laboratory has a prestigious history, as demonstrated by our numerous publications”), and references to the benefits shared by the students and the university (“Your performance benefits you and your university, because through research, your university attains better resources”). The transformational instructions communicated individual support and consideration for the students (“I know this may be a difficult task, and you may be feeling a little nervous”) and also suggested that the students view the task as an opportunity for learning and creativity (“Feel free to use any strategy that you think will work best for you” and “You might view this task as an opportunity to practice your math skills”). Based on the method developed by Awamleh and Gardner (1999), the instructions involved direct eye contact, vocal variability, use of an animated voice, use of animated facial expressions (smiles in particular), and hand and bodily gestures.

2.2.2. Transactional-contingent reward instructions

These instructions emphasized performance–reward relationships and provided general information about the task, as consistent with past research manipulating non-charismatic leadership (Hunt, Boal, & Dodge, 1999). The instructions encouraged students to perform well because they received course credit (“Perform as many subtractions as you can during the three-minute task period, because you’re receiving course credit for your participation. Generally, other students who are given course credit for their participation perform quite well on this task, and I expect the same level of performance from you”). This is consistent with the conceptualization of transactional-contingent reward leadership as focusing on the performance–reward relationship (Bass, 1998). Similar to previous research, the instructions emphasized the details of the task, used neutral emotional expressions, intermittent eye contact, and a neutral tone of voice (Awamleh & Gardner, 1999).

2.2.3. Transactional-management by exception instructions

These instructions emphasized that the students’ performance was being monitored and that they were to avoid making mistakes (“Avoid making mistakes during this task, because your performance is being monitored, and any mistakes will be noted”). This is consistent with the conceptualization of transactional-management by exception leadership because of the emphasis on avoiding mistakes (Bass, 1998). These instructions emphasized the details of the task, neutral emotional expressions were used, eye contact was intermittent, and a neutral tone of voice was used (Awamleh & Gardner, 1999).

2.2.4. Manipulation checks

Fourteen items were used to test the effectiveness of the leadership manipulations. Participants rated their agreement with the items using 5-point Likert scales. The transformational leadership items assessed whether participants felt inspired, encouraged,

² The length of each instructional set was approximately 90 s and the same male actor served in all videos.

and supported by the person in the video (six items; $\alpha = .88$). Example items were prefaced by, “The individual in the video” and included: “inspired me”, “was someone I can admire”, and “encouraged me to see the task in new ways.” The transactional-contingent reward items assessed whether the participants felt they were being compensated for their performance and whether they were encouraged to perform well because of the rewards they would receive (four items; $\alpha = .80$). Example items were prefaced by, “The individual in the video” and included: “gave me rewards in exchange for my performance” and “encouraged me to perform well because of what I am getting in return.” The transactional-management by exception items assessed whether the participants felt encouraged not to make mistakes (four items; $\alpha = .83$). Example items were prefaced by, “The individual in the video” and included: “encouraged me not make mistakes” and “emphasized that my performance was being evaluated.”

2.2.5. Stressor

Participants performed a mental arithmetic task for three minutes. The general instructions for the math task were consistent across all conditions, “This task requires that you count backwards, by sevens, starting from a four-digit number.” Mental arithmetic tasks such as this have been validated as stressors that elicit heightened psychological and cardiovascular responses (Kelsey, 1991; Schneider, 2004).

2.2.6. Performance

The percentage of correct responses (total number of correct answers / total number of responses) was used as an objective performance measure.

2.3. Materials

2.3.1. Perceived social support (SS)

Nine items were adapted from the Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981) to assess the receipt of emotional and informational support ($\alpha = .90$). Participants rated their agreement with the items using 7-point Likert scales. Example items were prefaced by, “The individual in the video” and included: “provided useful information to me,” “showed concern for my well-being,” and “helped take my mind off of the demands of the situation.”

2.3.2. Task-specific self-efficacy (TSSE)

Task-specific self-efficacy was assessed using a modified version of the Personal Efficacy Beliefs Scale (Riggs, Warka, Babasa, Bentancourt, & Hooker, 1994). Six items were modified from the original version to reflect self-efficacy for the task at hand, rather than an individual's job ($\alpha = .83$). Participants used 7-point Likert scales to rate their agreement with the items. Example items include: “I have confidence in my ability to do this task,” and “I have all the skills needed to perform this task well.”

2.3.3. Positive and negative affect

The positive and negative affect schedule (Watson, Clark, & Tellegen, 1988) assessed state affect before and after the instruction manipulations. Participants rated their experience of 20 different emotions at the present moment using a 5-point scale ranging from slightly or not at all (1) to extremely (5). Ten items assessed positive affect (attentive, interested, alert, excited, enthusiastic, inspired, proud, determined, strong, and active; baseline $\alpha = .86$, post-manipulation $\alpha = .88$), and ten items assessed negative affect (distressed, upset, hostile, irritable, scared, afraid, ashamed, guilty, nervous, and jittery; baseline $\alpha = .87$, post-manipulation $\alpha = .88$). The positive and negative affect scores reported in the results section were computed by subtracting baseline from post-task values, as has been done in past stress reactivity research (Schneider, 2004; Tomaka et al., 1993).

2.3.4. Stressor appraisals

Six items assessed stressor appraisals. Three items indexed primary appraisals, personal stakes or relevance (e.g., how stressful do you expect the upcoming task to be, how threatening do you expect the upcoming task to be, and how demanding do you expect the upcoming task to be; $\alpha = .82$). Three items assessed secondary appraisals, two assessed coping ability and one indexed availability of coping resources (e.g., how able are you to handle the burden of this task, how well do you think you can manage the demands imposed on you by this task, and I have the resources needed to overcome this situation; $\alpha = .81$). The items were rated on 5-point Likert scales. The items for each dimension were averaged and placed in a ratio (primary appraisal average/secondary appraisal average), where higher scores denote higher threat appraisals. This procedure is consistent with past research (Schneider, 2004).

2.4. Procedure

Following consent, participants completed baseline scales including demographics and baseline emotion. Items were presented on a computer monitor and participants responded using a wireless keyboard. Participants were then randomly assigned to receive one set of task instructions (TF, TA-CR, or TA-MBE). The task instructions (digitally-recorded videoclips) were played on a computer monitor. Immediately following, participants completed the manipulation check scales and rated perceived social support, task-specific self-efficacy, state affect, and stressor appraisals via the computer monitor. The task commenced. Participants performed the task for 3 min while a research assistant monitored their performance in an adjacent room. Participants were then debriefed.

3. Results

3.1. Manipulation checks

A multivariate analysis of variance (MANOVA) was computed to analyze the effectiveness of the manipulations using the manipulation check ratings. There was a significant multivariate effect of leadership condition on the manipulation check scales, Wilk's $\lambda = .39$; $F(6, 418) = 42.21$, $p < .001$. Univariate tests indicated that leadership condition had a significant influence on each scale: transformational, $F(2, 213) = 33.01$, $p < .001$, transactional-contingent reward, $F(2, 213) = 36.85$, $p < .001$, and transactional-management by exception, $F(2, 213) = 87.24$, $p < .001$. Bonferroni post-hoc tests confirmed that individuals exposed to the transformational condition gave higher transformational ratings than the other two conditions, those exposed to the transactional-contingent reward condition gave higher contingent reward ratings than the other two conditions, and those exposed to the transactional-management by exception condition gave higher transactional-management by exception ratings than the other two conditions. These findings demonstrate the effectiveness of the different videos in evoking different perceptions of the leader (actor) who provided task instructions.

3.2. Hypothesis testing

Descriptive statistics and correlations among all study variables are presented in Table 1. Table 2 presents descriptive statistics by condition. Hypothesis 1 predicted that participants in the transformational condition would perform a stressful task better than individuals in either transactional condition. This hypothesis was partially supported. Leadership condition had a significant influence on task performance, $F(2, 199) = 5.58$, $p < .01$. Table 2 shows that participants in the transformational condition evidenced significantly higher performance compared to the transactional-management by exception condition. There were no differences in performance between the transformational and transactional-contingent reward conditions.

Hypothesis 2 predicted that participants in the transformational condition would report more social support than individuals in either transactional condition. This hypothesis was supported. Leadership condition had a significant influence on social support perceptions, $F(2, 213) = 44.31$, $p < .001$. Table 2 shows that participants in the transformational condition reported significantly higher social support perceptions than those in the transactional-contingent reward condition, who reported higher social support than those in the transactional-management by exception condition, as expected.

Hypothesis 3 predicted that participants in the transformational condition would report greater task-specific self-efficacy than individuals in the other conditions. This hypothesis was partially supported. Leadership condition had a significant influence on task-specific self-efficacy beliefs, $F(2, 213) = 4.88$, $p < .01$. Table 2 shows that participants in the transformational condition reported significantly higher efficacy beliefs compared to the transactional-management by exception condition, as expected. Though individuals in the transformational condition appeared to report higher efficacy beliefs compared to the transactional-contingent reward condition, this difference was only marginally significant.

Hypothesis 4a predicted that participants in the transformational condition would have a smaller stress-related decrease in positive affect compared to individuals in the other conditions. This hypothesis was not supported. Leadership condition had no influence on positive affect change, $F(2, 213) = 0.48$, *ns*. Hypothesis 4b predicted that participants in the transformational condition would have a smaller stress-related increase in negative affect compared to individuals in the other conditions. This hypothesis was partially supported. Leadership condition had a marginally significant influence on negative affect change, $F(2, 213) = 2.35$, $p < .10$. Table 2 shows that participants in the transactional-management by exception condition evidenced greater increases in negative affect compared to the transformational condition, though this difference was only marginally significant.

Hypothesis 5 predicted that participants in the transformational condition would report lower threat appraisals than individuals in the other conditions. This hypothesis was supported. Leadership condition had a significant influence on stress appraisals, $F(2, 211) = 8.72$, $p < .001$. As shown in Table 2, participants in the transformational condition reported lower threat appraisals compared to either transactional condition, as expected.

Hypothesis 6 predicted that the influence of leadership style on task performance would be indirect through the impact of leadership style on social support, task-specific self-efficacy, state affect, and stressor appraisals. This hypothesis was tested using structural equation modeling (SEM; Kline, 1998). Given the interest in comparing the transformational condition to the two

Table 1
Descriptive statistics and correlations among all study variables.

Variable (<i>N</i> = 214)	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Social Support	2.38	0.81							
2. Task-Specific Self-Efficacy	2.89	0.77	.33**						
3. Positive Affect Baseline	2.85	0.77	.19**	.25**					
4. Negative Affect Baseline	1.61	0.65	.14*	-.02	.18**				
5. Positive Affect Post-manipulation	2.27	0.80	.32**	.38**	.65**	.06			
6. Negative Affect Post-manipulation	1.93	0.76	-.05	-.43**	.00	.42**	-.05		
7. Threat Appraisals	1.17	0.68	-.33**	-.70**	-.20**	.13*	-.31**	.51**	
8. Percentage Correct	0.74	0.26	.02	.20**	.02	-.19**	.16*	-.10	-.15*

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

Table 2

Descriptive statistics, by condition, for all study variables.

Variable	Condition		
	TF	TA-CR	TA-MBE
Percentage Correct	.79 (.21) _a	.77 (.22) _a	.65 (.32) _b
Social Support	2.93 (.75) _a	2.36 (.70) _b	1.86 (.58) _c
Task-Specific Self-Efficacy	3.11 (.77) _{a†}	2.84 (.78) _{b†}	2.73 (.71) _c
Positive Affect Change	−.53 (.62)	−.58 (.72)	−.63 (.63)
Negative Affect Change	.17 (.67) _{a†}	.30 (.76)	.44 (.83) _{b†}
Threat Appraisals	.91 (.46) _a	1.25 (.78) _b	1.35 (.68) _b

TF = Transformational Condition ($n = 71$), TA-CR = Transactional-Contingent Reward Condition ($n = 72$), and TA-MBE = Transactional-Management by Exception ($n = 71$). Means in the same row with different subscripts differ at $p < .05$. $†p < .10$.

transactional conditions, the transformational condition was used as the reference group for creating two dummy variables. Two dummy-coded variables were created to represent: 1) the comparison of the transformational with the transactional-contingent reward condition (“dummy 1” in the SEM model), and 2) the comparison of the transformational with the transactional-management by exception condition (“dummy 2” in the SEM model). Using SEM, an indirect effects model (as shown in Fig. 1), which posited an indirect link between leadership and performance through various psychosocial variables, was compared to a direct effects model (as shown in Fig. 2), where leadership style differences are directly related to performance. The fit of each model was first evaluated against published standards. Research suggests that a good-fitting SEM model should have the following characteristics: goodness of fit index (GFI) $>.95$, comparative fit index (CFI) $>.95$, and a root mean square of approximation (RMSEA) $<.06$ (see Hu & Bentler, 1999). The chi-square statistic can also be used to evaluate structural equation models, though this statistic is heavily influenced by sample size (Kline, 1998). Therefore, the aforementioned fit indices are traditionally used as a better test for the fit of a model. The chi-square statistic is however used to evaluate differences between two or more pre-specified models (Kline, 1998).³ In the present research, the chi-square statistic was used to test for differences between an indirect effects model and a direct effects model.

The fit indices for both models are shown in Table 3. Table 3 shows that both the indirect effects model (depicted in Fig. 1) and the direct effects model (depicted in Fig. 2) had acceptable fit according to two out of three fit indices. Unexpectedly, the direct effects model had significantly better fit than the indirect effects model, $\chi(2) = 15.6$, $p < .001$. Thus, leadership style had a direct rather than an indirect influence on task performance. As shown in Fig. 2, the transformational leadership condition evoked better performance compared to the transactional management-by-exception condition, but there were no significant differences in performance between the transformational and transactional-contingent reward conditions.

In summary, leadership style significantly influenced task performance, social support perceptions, efficacy beliefs, change in negative affect, and stressor appraisals. As expected, the transformational condition was associated with higher social support perceptions, greater efficacy perceptions, lower threat appraisals, and generally less of an increase in negative affect in response to a stressor. Both the transformational and the transactional-contingent reward conditions were associated with higher overall performance compared to the transactional-management by exception condition. Unexpectedly, the influence of leadership style on task performance was direct rather than indirect.

4. Discussion

The present study manipulated different leadership styles to examine their impact on a variety of subordinate outcomes during a stressful transaction. It was expected that individuals exposed to a transformational leader would perform better on a stressful task than those exposed to a transactional leader. This hypothesis was partially supported. Individuals in the transformational condition outperformed individuals in the transactional-management by exception condition but not individuals in the transactional-contingent reward condition. A recent meta-analysis found that transformational and transactional-contingent reward leaders have a similar influence on subordinate performance (Judge & Piccolo, 2004). Interestingly, those same performance effects were replicated in this experimental study. The present findings suggest that organizations could promote either transformational or transactional-contingent reward leadership styles and expect high productivity. However, the same does not hold true for other important subordinate outcomes.

The second hypothesis predicted that individuals exposed to a transformational leader would report higher social support than individuals exposed to transactional leaders. This hypothesis was supported. Individuals in the transformational condition reported receiving more social support than individuals in either the transactional-contingent reward or the transactional-management by exception conditions, as expected. This is consistent with past research (Podsakoff et al., 1990) and theory (Bass, 1998). The individualized consideration dimension of transformational leadership appears to be a robust element of transformational leadership that differentiates these leaders from others. The benefits of social support are well-documented

³ If the difference in chi-square between two models is significant then the model with the lower chi-square value represents a significant improvement over the other model, suggesting that the former be accepted and the latter rejected. A non-significant chi-square indicates that the two models are statistically equivalent. In keeping with parsimony, the model with the fewest parameters estimated would be accepted.

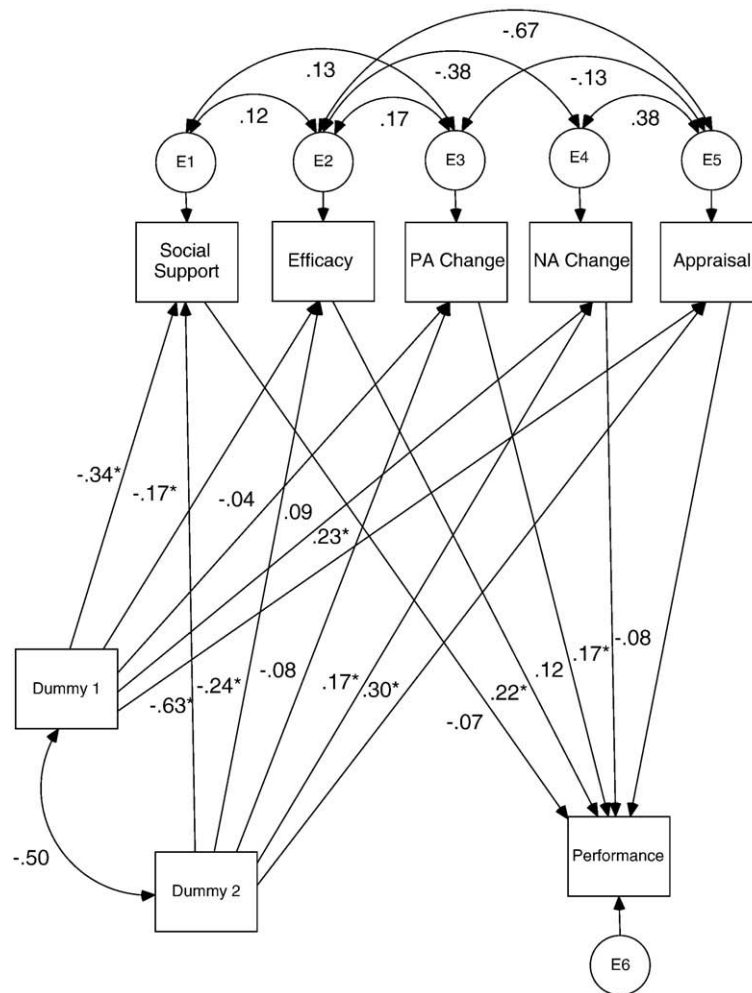


Fig. 1. Summary for model 1. Note: * denotes $p < .05$.

(see Cohen & Wills, 1985 for a review). Social support from one's immediate supervisor has been shown to reduce work stress (Sargent & Terry, 2000), thus suggesting that leaders who engender social support perceptions (notably transformational leaders) should be encouraged in the workplace.

Third, we predicted that individuals exposed to a transformational leader would report higher task-specific self-efficacy beliefs compared to those exposed to transactional leaders. This hypothesis was partially supported. Individuals in the transformational condition reported higher task-specific self-efficacy beliefs compared to those in the transactional-management by exception condition. Individuals in the transformational condition tended to report higher task-specific self-efficacy beliefs than those in the transactional-contingent reward condition, however this was only marginally significant. An underlying assumption of transformational leadership theory is the ability of transformational leaders to increase subordinates' effort-performance expectancies (Shamir et al., 1993). Yet this fundamental supposition has never been empirically tested using experimental methods, that is, until now. Past research has found that task-specific self-efficacy is malleable (Chen, Gully, Whiteman, & Kilcullen, 2000). Consistent with that research, the present study found that transformational leadership has a beneficial influence on subordinates' task-specific self-efficacy beliefs. However, caution should be taken when drawing inferences about the comparison between transformational and transactional-contingent reward leaders, given the marginal significance of the present results.

Fourth, we predicted that individuals exposed to a transformational leader would a) experience a smaller stress-related decrease in positive affect compared to those in the transactional conditions, and b) experience a smaller increase in negative affect compared to those in the transactional conditions. Unexpectedly, leadership had no influence on positive affect. This is inconsistent with past research, which has found a positive relationship between participant's experience of positive affect and experimental manipulations of charismatic leadership (see Bono & Ilies, 2006; Cherulnik et al., 2001). However, there are two crucial elements that distinguish the present study from past research. Much of the past research has focused on the basic emotional contagion process and has used passive exposure to explore whether participants benefit from charismatic leadership styles. In contrast, the present study actively engaged participants in a performance situation. This task focus may have diverted participants' attention

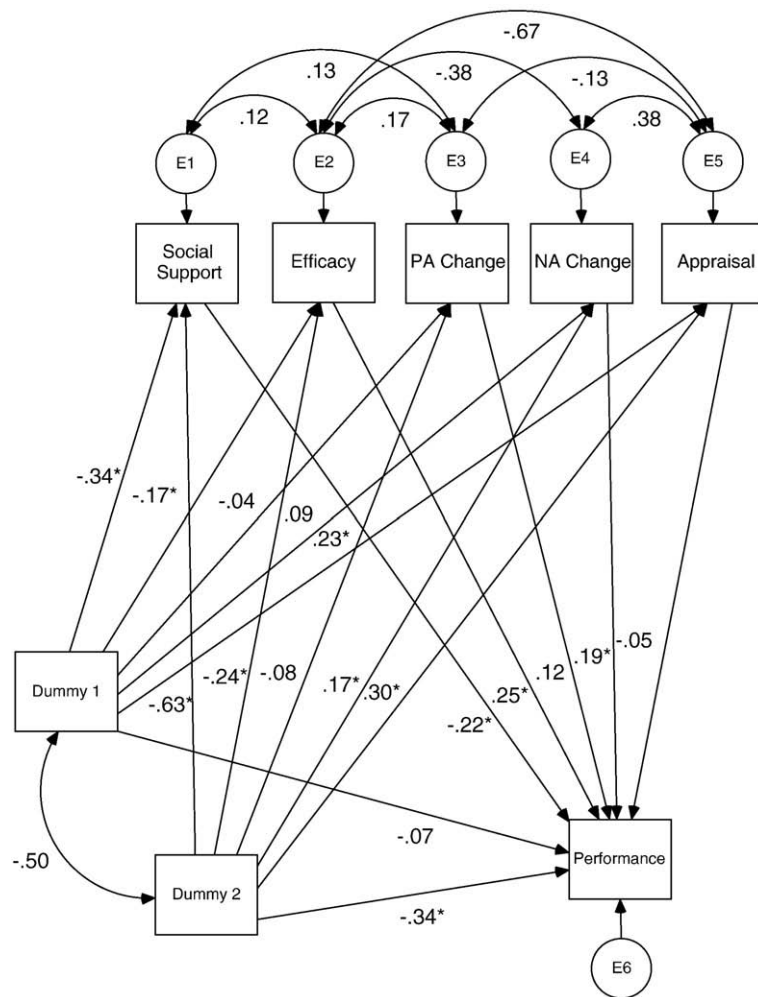


Fig. 2. Summary for model 2. Note: * denotes $p < .05$.

from the emotional expressions of the transformational leader and may have inhibited the emotional contagion process. Researchers suggest that as individuals engage in more detailed information processing strategies (similar to those they might experience during a performance situation) that there is a lower likelihood of heuristics influencing their information processing (Forgas, 1995). The detailed processing associated with a performance situation may have inhibited the heuristic process of emotional contagion. Secondly, participants in the present study were asked to perform a stressful mental arithmetic task. Generating changes in positive affect can be challenging in laboratory settings (Cacioppo & Berntson, 1994) and these challenges may be exacerbated when participants are asked to engage in a stressful task. Non-stressful task conditions may create more optimal laboratory conditions to study how the emotional contagion process influences positive affect.

Changes in negative affect may be more meaningful in a stressful task condition. Leadership did tend to influence negative affect, although this effect was marginally significant. Individuals in the transactional-management by exception condition appeared to have greater increases in negative affect following the stressor instructions than those in the transformational condition. This is consistent with past research findings that transformational leadership is related to less frustration among

Table 3
Structural equation model summaries and comparisons.

	χ^2	df	GFI	CFI	RMSEA	RMR
Indirect Effects	28.6	5	.97	.94	.15	.02
Direct Effects	13.00	3	.99	.97	.13	.02
Model Comparison	28.6	5				
Difference	15.6	2***				

*** $p < .001$.

subordinates (McColl-Kennedy & Anderson, 2002). Contemporary leaders are believed to engage subordinates at an emotional level (George, 2000), and this emotional interaction is believed to, in part, drive the effectiveness of transformational leaders (Bass, 1998; Shamir et al., 1993). Past research has also shown that transformational leadership buffers individuals from the deleterious effects of emotional regulation on job satisfaction (Bono et al., 2007). Perhaps this buffering effect occurred because transformational leaders inhibit the experience of negative emotions among their employees relative to other leaders.

The fifth hypothesis predicted that individuals exposed to a transformational leader would evaluate an impending stressor as less threatening than those exposed to transactional leaders. This hypothesis was supported. Individuals in the transformational condition evaluated the mental arithmetic task as less threatening compared to the individuals in both of the transactional leadership conditions, as expected. Past research has shown that supportive leadership behaviors are related to lower reports of stress among employees (Britt, Davidson, Bliese, & Castro, 2004; Sosik & Godshalk, 2000). The present research supports these findings and augments them by using experimental methods, demonstrating that transformational leaders diminish subordinate threat appraisals. This is a crucial finding given the impact and prevalence of leaders in organizations (Yukl, 1998). The present research suggests that subordinates' evaluations of their work tasks, whether as an overwhelming demand or a challenging opportunity, depends partly on the leaders from whom they obtain directives about their work. The consequences of work-related stress to both the employee and the organization are well-documented (Cooper, Dewe, & O'Driscoll, 2001) and the present research suggests that leadership development/selection using the transformational leadership paradigm may help in these regards.

While the present study sought to examine the costs/benefits of different leadership styles on individual stress outcomes in an experimental scenario, it also explored a mediational relationship between leadership style, subordinate stress-related outcomes, and task performance. The last hypothesis predicted that the influence of leadership style on task performance would be indirect through the impact of leadership style on social support, task-specific self-efficacy, state affect, and stress appraisals. This hypothesis was not supported. A direct effects model, which depicted the effects of leadership on task performance as direct rather than an indirect, was found to better fit the data relative to an indirect effects model. This is inconsistent with transformational leader theory which posits that these leaders enhance subordinate performance by appealing to subordinate emotions (George, 2000), enhancing effort-performance expectancies (Shamir et al., 1993) by being supportive, and by promoting an opportunistic perspective on harsh task demands (Bass, 1998).

There are two possible explanations for these findings. First, the leadership manipulation in the present research was based on a brief interaction. Subordinates may experience performance benefits due to increased social support and efficacy, coupled with reduced negative affect and minimized threat appraisals over time as they repeatedly interact with transformational leaders. Secondly, the highly-structured task may have impeded the mediational relationship. There were few opportunities for creativity and social interaction during the math task, and while an individual may have been motivated to perform well, performance on the task was also reliant on individuals' math skills. Future research might examine this same mediational relationship under task conditions that require creativity and social interaction.

While this particular hypothesis was not supported, the present study substantiates a variety of claims about how transformational leaders influence subordinate outcomes. The mechanisms through which leaders impact employee performance remain elusive, however future studies should build on the present research, using experimental methods to uncover potential mediators of leadership style and employee performance. One particular domain, motivation, may inform and fuel future research efforts. Leaders may directly impact task performance while indirectly influencing constructs such as motivation. An exploratory post-hoc analysis tested this assertion by replacing task performance in the SEM analysis with individual's intentions to perform well for this particular leader. Specifically, participants were asked three questions relating to how much they would be willing to work for the individual in the video. Two models were created (indirect effects and direct effects), with willingness, rather than task performance as the outcome. The two models did not differ significantly, $\chi(1) = 1.11$, *ns*, suggesting that the model with the fewest parameters (i.e., the indirect effects model) be accepted. While this was simply a post-hoc, exploratory analysis, it suggests that a relationship between leadership style and motivation may operate indirectly through social support, efficacy, state affect, and stress appraisals. Future research should explore this issue further.

In summary, the present study identified areas of convergence and divergence with regard to the transformational leadership literature. The study showed that laboratory manipulations of transformational and transactional leadership can result in performance effects that mirror a recent meta-analysis (see Judge & Piccolo, 2004), such that both contingent reward and transformational leadership styles are beneficial to performance relative to management by exception leadership. In congruence with theory, this study partly demonstrated that transformational leaders can benefit subordinate's perceptions of social support, efficacy beliefs, negative emotions, and stressor appraisals relative to transactional styles. In contrast to theory, the present study showed that the influence of transformational leadership on subordinate performance is direct, rather than indirect.

4.1. Limitations and future research

Experimental methods are powerful research tools that allow researchers to manipulate key variables under controlled settings but these inherent strengths often equate to costs when considering external validity (Rosenthal & Rosnow, 1991). The present research applied a static operational definition of leadership and used a brief video exposure as a leadership manipulation. Actual leaders likely fluctuate between different styles depending on the context and their interactions with subordinates may span durations from a few days to several years. Despite these limitations, the use of orthogonal leadership styles was necessary to differentiate the benefits/costs of different leadership styles and to begin to fill the void of experimental research in context of

transformational leadership theory. Though the manipulations were brief, stress is a process (see Lazarus & Folkman, 1984) where repeated exposures to predominant leadership styles may actually bolster the present findings.

Another potential limitation of the present research is the use of a non-traditional work task. It is unlikely that even the most malicious of supervisors would require subordinates to perform vocal mental arithmetic in the workplace. However, managers will require their employees to perform stressful tasks (giving verbal presentations, working under high time pressure, adapting to new and challenging tasks, etc.). Several previous studies have found that mental arithmetic is associated with heightened cardiac activity and psychological distress (Kelsey, 1991; Lyons & Schneider, 2005; Schneider, 2004; Tomaka et al., 1993). The use of mental arithmetic as a validated stressor can provide researchers with important information about the basic stress process. Then, these relationships can be further examined in applied settings to ensure that the same principles, theories, and models generalize to the workplace. Though this research did not use a workplace task (such as an in-basket), the implications of this research are applicable to workplace environments where organizational leaders are a prominent influence on employees. It is notable however, that despite the use of a non-traditional work task, there were several findings that parallel those revealed in field studies exploring the effects of leadership on performance, social support, and negative emotion.

A third potential limitation involves the complexity of leadership itself. Leadership perceptions may be context-dependent. Individuals may be more likely to attribute charismatic characteristics to a leader during a crisis or otherwise stressful situation (Conger, 1990; Halverson, Murphy, & Riggio, 2004), similarly crisis situations may create the optimal conditions for charismatic leaders to emerge (Shamir & Howell, 1999). The present study only explored the effects of leadership as participants performed a stressful task and it did not consider using a non-stressful task as a comparator.

Future research should explore the impact of transformational leaders on subordinate outcomes using longitudinal designs. These longitudinal studies will help to uncover the influence of transformational leaders on processes such as motivation, emotions, stressor appraisals, and performance over the course of extended interactions. Additionally, future studies, particularly experimental studies, should explore these effects under a variety of task scenarios. Researchers might consider using creative tasks, problem-solving tasks, and team tasks to set up both stressful (i.e., highly demanding) and non-stressful task scenarios. These different scenarios can be used to explore whether the effects of transformational leadership on subordinate outcomes are moderated by the degree of stress or turbulence in the environment, as has been found in field studies (Waldman, Ramirez, House, & Puranam, 2001).

Ultimately, it is likely that a combination of both situational and leadership characteristics determine subordinate reactions and perceptions of leadership. Researchers need to do a better job of integrating leadership theories to address both types of characteristics (Chemers, 2000). Research is needed that integrates transformational leadership theory with contingency theories to explore if there are particular conditions under which transformational leaders are more or less effective. There may be certain situations in which transformational leadership results in heightened distress among employees. For example, employees who are unable to cope with the high performance expectations of transformational leaders may experience burnout overtime (Conger & Kanungo, 1998). Additionally, certain group dynamics (Schaubroeck, Lam, & Cha, 2007) and other contextual factors (Shamir & Howell, 1999) may moderate the impact of transformational leaders on individuals and teams. Researchers might examine how transformational leadership aligns with Leader–Member Exchange (LMX) theories. There has been considerable research on the influence of LMX on subordinate stress (see Harris & Kacmar, 2006; Townsend, Phillips, & Elkins, 2000); yet few researchers have explored the interface between LMX and transformational leadership.

5. Conclusion

We live in an era where leadership represents a motivational, emotional, and developmental part of organizational success; thus a variety of subordinate outcomes are important factors to consider when evaluating leadership effectiveness. The present study provided experimental evidence that transformational leadership is beneficial not only for performance, but also when considering social support, efficacy beliefs, negative emotions, and stressor appraisals. The leaders of the future are faced with onerous challenges. They must be adept at influencing subordinates' motivational, emotional, and developmental needs in the stressful context of modern work. This shift in the focus of leadership effectiveness requires that leadership researchers follow suit and consider a wider range of outcome variables in leadership research. Transformational leaders, with their arsenal of inspirational motivation, idealized influence, individualized support, and intellectual stimulation stand poised to meet these challenges of today and those of the future.

References

- Awamleh, R., & Gardner, W. L. (1999). Perceptions of leader charisma and effectiveness: The effects of vision content, delivery, and organizational performance. *Leadership Quarterly*, 10, 345–373.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. San Francisco: W. H. Freeman.
- Barrera, M., Sandler, I. N., & Ramsay, T. B. (1981). Preliminary development of a scale of social support: Studies on college students. *American Journal of Community Psychology*, 9, 435–447.
- Basch, J., & Fisher, C. (2000). Affective events–emotions matrix: A classification of work events and associated emotions. In N. M. Ashkanasy, C. E. J. Hartel, & W. J. Zerbe (Eds.), *Emotions in the workplace: Research, theory, and practice* (pp. 36–49). Westport, Connecticut: Quorum Books.
- Bass, B. M. (1998). *Transformational leadership: Industrial, military, and educational impact*. Mahwah, NJ: Erlbaum.
- Blascovich, J., & Tomaka, J. (1996). The biopsychosocial model of arousal regulation. In M. Zanna (Ed.), *Advances in experimental social psychology*, 28 (pp. 1–51). New York: Academic Press.
- Bono, J. E., Foldes, H. J., Vinson, G., & Muros, J. P. (2007). Workplace emotions: The role of supervisors and leadership. *Journal of Applied Psychology*, 92, 1357–1367.
- Bono, J. E., & Ilies, R. (2006). Charisma, positive emotions and mood contagion. *Leadership Quarterly*, 17, 317–334.
- Britt, T. W., Davidson, J., Bliese, P. D., & Castro, C. A. (2004). How leaders can influence the impact that stressors have on soldiers. *Military Medicine*, 169, 541–545.

- Brown, D. J., & Lord, R. G. (1999). The utility of experimental research in the study of transformational/charismatic leadership. *Leadership Quarterly*, 10, 531–539.
- Cacioppo, J. T., & Berntson, G. G. (1994). Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. *Psychological Bulletin*, 115, 401–423.
- Chemers, M. M. (2000). Leadership research and theory: A functional integration. *Group Dynamics*, 4, 27–43.
- Chen, G., Gully, S. M., Whiteman, J., & Kilcullen, R. N. (2000). Examination of the relationships among trait-like individual differences, state-like individual differences, and learning performance. *Journal of Applied Psychology*, 85, 835–847.
- Cherulnik, P. D., Donley, K. A., Wiewel, T., & Miller, S. R. (2001). Charisma is contagious: The effect of leaders' charisma on observers affect. *Journal of Applied Social Psychology*, 31, 2149–2159.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310–357.
- Conger, J. A. (1990). The dark side of leadership. *Organizational Dynamics*, 19, 44–55.
- Conger, J. A., & Kanungo, R. N. (1998). *Charismatic leadership in organizations*. Thousand Oaks: Sage.
- Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research, and applications*. Thousand Oaks, CA: Sage Publications.
- Erdogan, B., & Enders, J. (2007). Support from the top: Supervisors perceived organizational support as a moderator of leader–member exchange to satisfaction and performance relationship. *Journal of Applied Psychology*, 92, 321–330.
- Erez, A., & Isen, A. M. (2002). The influence of positive affect on the components of expectancy motivation. *Journal of Applied Psychology*, 87, 1055–1067.
- Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, 117, 39–66.
- George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations*, 53, 1027–1041.
- Gildea, K. M., Schneider, T. R., & Shebilske, W. L. (2007). Stress appraisals and training performance on a complex laboratory task. *Human Factors*, 49, 756–758.
- Halverson, S. K., Murphy, S. E., & Riggio, R. E. (2004). Charismatic leadership in crisis situations: A laboratory investigation of stress and crisis. *Small Group Research*, 35, 495–514.
- Harris, K. J., & Kacmar, K. M. (2006). Too much of a good thing: The curvilinear effect of leader–member exchange on stress. *Journal of Social Psychology*, 146, 65–84.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion*. New York: Cambridge University Press.
- Hobfoll, S. E. (1998). *Stress, culture, and community: The psychology and physiology of stress*. New York: Plenum.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Hunt, J. G., Boal, K. B., & Dodge, G. E. (1999). The effects of visionary and crisis-responsive charisma on followers: An experimental examination of two kinds of charismatic leadership. *Leadership Quarterly*, 10, 423–448.
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology*, 52, 1122–1131.
- Judge, T. A., & Piccolo, R. F. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of Applied Psychology*, 89, 755–768.
- Kelsey, R. M. (1991). Electrodermal lability and myocardial reactivity to stress. *Psychophysiology*, 28, 619–631.
- Kirkpatrick, S. A., & Locke, E. A. (1996). Direct and indirect effects of three core charismatic leadership components on performance and attitudes. *Journal of Applied Psychology*, 81, 36–51.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: The Guilford Press.
- Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. New York: Springer Publishing.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer-Verlag.
- Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review. *Leadership Quarterly*, 7, 385–426.
- Lyons, J. B., & Schneider, T. R. (2005). The influence of emotional intelligence on performance. *Personality and Individual Differences*, 39, 693–703.
- McColl-Kennedy, J. R., & Anderson, R. D. (2002). Impact of leadership style and emotions on subordinate performance. *Leadership Quarterly*, 13, 545–559.
- Offermann, L. O., & Hellmann, P. S. (1996). Leadership behavior and subordinate stress: A 360 view. *Journal of Occupational Health Psychology*, 1, 382–390.
- Phillips, J. M., & Gully, S. M. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal-setting process. *Journal of Applied Psychology*, 82, 792–802.
- Podsakoff, P. M., Mackenzie, S. B., & Bommer, W. H. (1996). Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust and organizational citizenship behaviors. *Journal of Management*, 22, 259–298.
- Podsakoff, P. M., Mackenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects of followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly*, 1, 107–142.
- Riggs, M. T., Warka, J., Babasa, B., Betancourt, R., & Hooker, S. (1994). Development of self-efficacy and outcome expectancy scales for job-related applications. *Educational and Psychological Measurement*, 54, 793–802.
- Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis*, 2nd Ed. New York: McGraw-Hill.
- Sarason, I. G., & Sarason, B. R. (1986). Experimentally provided social support. *Journal of Personality and Social Psychology*, 50, 1222–1225.
- Sargent, L. D., & Terry, D. J. (2000). The moderating role of social support in Karasek's job strain model. *Work & Stress*, 14, 245–261.
- Schaubroeck, J., Lam, S. S. K., & Cha, S. E. (2007). Embracing transformational leadership: Team values and the impact of leader behavior on team performance. *Journal of Applied Psychology*, 92, 1020–1030.
- Schneider, T. R. (2004). The role of neuroticism on psychological and physiological stress responses. *Journal of Experimental Social Psychology*, 40, 795–804.
- Shamir, B., House, R. J., & Arthur, M. B. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organizational Science*, 4, 577–594.
- Shamir, B., & Howell, J. M. (1999). Organizational and contextual influences on the emergence and effectiveness of charismatic leadership. *Leadership Quarterly*, 10, 257–283.
- Sosik, J. J., & Godshalk, V. M. (2000). Leadership styles, mentoring functions received, and job-related stress: A conceptual model and preliminary study. *Journal of Organizational Behavior*, 21, 365–390.
- Tomaka, J., Blascovich, J., Kelsey, R. M., & Leitten, C. L. (1993). Subjective, physiological, and behavioral effects of threat and challenge appraisals. *Journal of Personality and Social Psychology*, 66, 248–260.
- Townsend, J., Phillips, J. S., & Elkins, T. J. (2000). Employee retaliation: The neglected consequence of poor leader–member exchange relations. *Journal of Occupational Health Psychology*, 5, 457–463.
- Waldman, D. A., Ramirez, G. G., House, R. J., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *The Academy of Management Journal*, 44, 134–143.
- Walumbwa, F. O., Wang, P., Lawler, J. J., & Shi, K. (2004). The role of collective efficacy in the relations between transformational leadership and work outcomes. *Journal of Occupational & Organizational Psychology*, 77, 515–530.
- Watson, D., Clark, L., & Tellegen, A. (1988). Development and validation of a brief measure of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Yammarino, F. J., Spangler, W. D., & Bass, B. M. (1993). Transformational leadership and performance: A longitudinal investigation. *Leadership Quarterly*, 4, 81–102.
- Yukl, G. A. (1998). *Leadership in organizations*, 4th Ed. Englewood Cliffs, NJ: Prentice Hall.