



Leadership and stress: A meta-analytic review



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ARTICLE INFO

Article history:

Received 12 June 2016

Received in revised form 27 September 2016

Accepted 4 October 2016

Available online 13 October 2016

Keywords:

Leadership

Stress

Burnout

Transformational leadership

LMX

Abusive supervision

ABSTRACT

Stress has been implicated as an important determinant of leadership functioning. Conversely, the behavior of leaders has long been argued to be a major factor in determining the stress levels of followers. Yet despite the widespread acknowledgement that stress and leadership are linked, there has been no systematic attempt to organize and summarize these literatures. In the present, we meta-analytically review the relationship between three leadership constructs (transformational leadership, leader-member exchange, and abusive supervision) and stress and burnout. Our analyses confirm that leader stress influences leader behavior and that leadership behaviors and leader-follower relationships are significant determinants of stress and burnout in subordinates. We build on these results to suggest new avenues for research in this domain as well as discussing how these results can inform practice with regards to leader development.

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Introduction

In many ways, stress and leadership are inextricably linked with one another. Some have argued that it is only in moments of great crisis that heroic leadership can be displayed (Bryman, 1993; House, Spangler, & Woycke, 1991). Others argue that such crises are instances where the true character of a leader may shine through (Hannah, Uhl-bien, Avolio, & Cavarretta, 2009) or that moments of extreme stress can serve as crucibles for the development of leadership skills (Bennis & Thomas, 2002; Kolditz, 2007). It has also been argued that such events are precisely when leadership is most needed, because the presence of leaders who can handle stressful events effectively make for more efficient decision-making and group fitness (Van Vugt, Hogan, & Kaiser, 2008). And it is crucial to know that your leader can handle stress well because leaders face a great deal of stress (Day, Sin, & Chen, 2004) and there is a burgeoning literature documenting not only how stress can impact leadership, but also how leaders can alternatively be a source of stress or source of relief from stress. In this paper, we meta-analytically review the literature concerning stress and leadership, both looking at leader stress as an antecedent of leadership behaviors and follower stress as a consequence of leadership behaviors.

As noted above, it seems intuitive to link leadership with stress. The Bass Handbook of Leadership (Bass & Bass, 2008) devotes an entire chapter to discussing the role of stress as both an antecedent and a consequence of leadership. More recently, *The Leadership Quarterly* devoted a special issue to the role of emotions in leadership processes (Connelly & Gooty, 2015). And yet at the same time, major reviews of the leadership literature have largely ignored the subject of stress. For example, recent meta-analyses

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of LMX (Dulebohn et al., 2012; Gerstner & Day, 1997; Martin et al., 2015), transformational leadership (Judge & Piccolo, 2004; Lowe, Kroeck, & Sivasubramaniam, 1996), and abusive supervision (the perception of a supervisor's sustained engagement in hostile verbal and non-verbal behaviors, excluding physical contact; Mackey, Frieder, Brees, & Martinko, *in press*; Tepper, 2000; Zhang & Liao, 2015) have all failed to address leader stress as a potential antecedent of leader behaviors or follower stress as potential consequence. Nor have recent meta-analytic reviews of constructs such as job stress and burnout addressed leadership styles as a potential antecedent (e.g. Cole, Walter, Bedeian & O'Boyle, 2012; Viswesvaran, Sanchez, & Fisher, 1999). However, not all reviews have ignored this topic. For example, a recent meta-analysis of destructive leadership (Schyns & Schilling, 2013) found a fairly robust relationship between abusive supervision and follower stress ($r = 0.31$) on the basis of 12 studies. Another review of abusive supervision (Mackey et al., *in press*) found similar effects for job tension and follower emotional exhaustion. But, on the whole, although the subject of how stress and leadership interact has been widely studied, it has not been brought together in such a way as to inform future scholarship in terms of the relative size of the relationship between leader stress and leadership behaviors or which forms of leadership are most associated with follower stress. Moreover, empirical evidence remains unclear regarding the strength of this relationship. The literature has remained fragmented, focusing on either 1) leadership stress and its impact on leader behaviors or 2) leader behaviors and their impact on follower stress, with no integration. Without integration and a comprehensive review, it is impossible to accurately assess this process. To address this, as well as recent calls for more research investigating the role of emotional experiences in leadership processes (Rajah, Song, & Arvey, 2011), we will review the nature of stress, what role it might play in determining leadership behaviors, and how leadership behaviors can act to buffer or induce stress in those around them. We will then make suggestions as to how the field might make use of these findings moving forward.

Stress and burnout

Stress refers to the physiological and/or psychological arousal that occurs when an individual perceives a threat to something of value to them and that threat taxes or exhausts the resources they have available to confront it (Hobfoll, 1989; Lazarus & Folkman, 1984; LePine, LepPine & Jackson, 2004). In the workplace, these typically take two forms: job stress and interpersonal stress (Fiedler, 1992). Job stress comes from the nature of the task itself (e.g. complexity, difficulty level) and the conditions the individual is operating under (e.g. time pressure, working conditions). Interpersonal stress comes from being in conflict with others or feeling that one must meet the demands or expectations of others. Regardless of the source, most stressors can be said to be stressful as a result of the potential threat being either unpredictable, uncontrollable, or both (Cohen, 1980). In addition, the more that an individual values a resource or relationship, the more stress that is likely to occur when that resource or relationship is threatened (Fiedler, 1992). Consequently, considerable psychological and material resources are often spent in an effort to either adapt to or reduce these stressors (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007).

Although stress researchers have argued that moderate levels of stress can be useful for activating behaviors and cognitions, too much stress tends to be detrimental to the individual's physical and psychological health (e.g. Cohen, Janicki-Deverts, & Miller, 2007; Kalimo et al., 2000; Melamed et al., 2006; Srivastava & Krishna, 1991). In situations where individuals are subjected to prolonged periods of stress (and subsequent extended resource expenditure), burnout is likely to occur (Maslach, 1982, Maslach & Jackson, 1981). That is, as stress mounts, the individual must increasingly divert psychological resources to combat its negative effects until those resources are exhausted and the individual feels overwhelmed and no longer able to cope with work (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Halbesleben & Buckley, 2004; Halbesleben & Leon, 2014; Hobfoll, 1988, 1989).

Burnout includes three primary symptoms: emotional exhaustion (feeling emotionally overwhelmed by one's work), depersonalization (also known as cynicism or disengagement, defined as detachment or indifference from others at work), and reduced personal accomplishment (also referred to as professional efficacy, which is the tendency to evaluate one's efforts and achievements negatively; Maslach, 1982, Maslach & Jackson, 1981). It is often considered a process with these symptoms increasingly manifesting themselves as stress accumulates. That said, there is no consensus regarding the order that these symptoms are likely to manifest themselves (Cordes & Dougherty, 1993).

In terms of problems at work, stress and burnout have been associated with reduced job performance and job satisfaction (Bakker, Demerouti, & Verbeke, 2004; Gilboa, Shirom, Fried, & Cooper, 2008; Halbesleben & Buckley, 2004; Sullivan & Bhagat, 1992), increased withdrawal and turnover (Griffeth, Hom, & Gaertner, 2000), higher rates of accidents (Murphy, DuBois, & Hurrell, 1986), and drug and alcohol use (Frone, 2008; Harris & Heft, 1992). Given the commonalities of the causes and consequences of stress and burnout, we anticipate that both constructs and their facets will relate to leadership in a similar fashion.

Leader stress as a cause of leadership behaviors

As noted above, it often seems like leadership becomes most necessary when things are going poorly. Consequently, it should be no surprise that leaders often report being under considerable stress. The Center for Creative Leadership reports that 88% of leaders say that work is the primary source of stress in their lives (Campbell, Baltes, Martin, & Meddings, 2007). One reason for this is that leaders face a great deal of potential sources of stress (Day, Sin, & Chen, 2004; Hunter, Tate, Dziewieczynski & Bedell-Avers, 2011). Evolutionary accounts of leadership suggest that despite having access to greater resources, individuals in leadership positions can experience greater amounts of stress because they are more likely to encounter threats or challenges from both inside and outside one's social group (de Waal, 1982; Mazur, 1985; Van Vugt et al., 2008). Other have argued that

the need to maintain an exemplary reputation so that others trust in your decision-making can be a significant drain on one's psychological resources and can lead to emotional exhaustion and poorer performance over time (Baer et al., 2015). For example, Henrich and Gil-White (2001) proposed that individuals who can gain prestige – either through copying models through social learning or obtaining high quality information – can cultivate reputations that can even exceed their area of expertise. However, this necessitates a heavy resource investment to identify and replicate model behaviors due to the large amount of information processing required. The increased stress associated with leadership roles is often not observable, however, because leaders are often selected for their ability to handle crises well (Van Vugt et al., 2008). Consequently, most, but not all, leaders are likely to display higher levels of stress tolerance even before they assume the leadership role (Mazur, 1985).

Even so, it is undeniable that stress can cause leaders to make bad decisions (Thompson, 2010). Effective leadership requires that the individual be able to dedicate significant cognitive resources to addressing problems and making decisions while maintaining awareness of the factors and circumstances that may change their decision-making parameters (Gibson, Fiedler, & Barrett, 1993; Mumford, Friedrich, Caughron, & Byrne, 2007). The experience of stress impedes these processes. For example, high levels of stress have been linked with lower levels of complex cognitive functioning (Arnsten, 1998), increases in the use of heuristics (Driskell & Salas, 1991) and aggressive behavior (Sprague, Verona, Kalkhoff & Kilmer, 2011), and a decreased likelihood of considering alternative solutions to problems (Hunter, Tate, Dziewieczynski and Bedell-Avers, 2011; Kienan, 1987). Leaders under stress are also likely to become more self-focused and less likely to assume a team perspective (Driskell, Salas, & Johnston, 1999; Salovey, 1992). Consequently, individuals whose psychological resources are taxed or exhausted are often unable to engage in positive leadership behaviors (Eubanks & Mumford, 2010) and may even be more prone to acting in destructive ways towards their followers when pressed (Bardes & Piccolo, 2010; Collins & Jackson, 2015). Indeed, prior studies have demonstrated that engaging in cognitively demanding tasks can lead to higher likelihoods of leaders engaging in abusive behaviors (Collins & Jackson, 2015).

In addition to the immediate effects of stressful situations on leadership behaviors, there is also an unfolding process by which leadership styles can develop in response to repeated stress events (Mumford et al., 2007). For example, cognitive resource theory (Fiedler, 1989) suggests that in a crisis a leader will often find that more directive communication patterns are more effective at organizing the group when there is not time to weigh large numbers of options and solicit feedback (Gibson et al., 1993). It is reasonable to assume that these behaviors could become internalized as the individual looks at their own behaviors and comes to define themselves in terms of how they have acted (Roberts, Caspi, & Moffitt, 2003; Wood & Roberts, 2006). This process unfolds as individuals interpret their actions based on the stimuli in their environment. Over time, individuals begin to articulate a role identity associated with their environment (Wood & Roberts, 2006). Thus, repeated instances of imposing one's will over others could be associated with developing an arrogant or abusive of dealing with others (Kipnis, 1972; Kipnis, Castell, Gergen, & Mauch, 1976). Some evidence suggests that this is the case. For example, instances of poor firm performance have been associated with an increased likelihood of engaging in "strongman" behaviors by leaders and decreases in behaviors associated with developing followers (Scully et al., 1994). Similarly, in military settings, the ongoing, high-stress nature of the job has been blamed in part for the high base rates of toxic leadership (Steele, 2011). On the whole then, the resource depletion and anxiety induced by the experience of stress makes it unlikely that positive leadership behaviors will be enacted and more likely that negative leadership behaviors will become more frequent (Bass & Bass, 2008; Spain, Harms, & Wood, in press).

H1A. Higher levels of leader stress and burnout will be related to lower levels of transformational leadership.

H1B. Higher levels of leader stress and burnout will be positively related to abusive supervision.

Leader behavior as a cause of subordinate stress

There is little disagreement in the leadership literature that leaders have the potential to be either a buffer against work stressors (Offerman & Hellman, 1996; Schmidt et al., 2014) or a major source of stress for their subordinates (Bass & Bass, 2008; Rajah, Song, & Arvey, 2011). Indeed, many employees rate their immediate supervisor as the worst aspect of their jobs (Hogan & Kaiser, 2005). There are a number of reasons why a leader might play an outside role in the well-being of their subordinates. To begin with, an individual's supervisor is often considered "the face" of the organization for an employee and a lens through which their work experiences are viewed (Gerstner & Day, 1997). Thus, their interpretation of the tasks they perform, relationships with coworkers, the fairness with which they are treated, and many other aspects of the job become tied to the way that their leader treats them.

Moreover, leaders play an outsized role in the lives of their subordinates because of their ability to distribute or withhold material or social resources (Fiedler, 1992; Van Vugt et al., 2008). Conservation of resource theory (Hobfoll, 2002) suggests that individuals desire to obtain and retain valued resources, both material and psychological. Thus, they will seek to maximize resource gains while minimizing resource losses and avoiding potential threats. To the degree that leaders can reduce ambiguity, provide guidance for efforts, encourage followers to pursue new avenues for growth, we would expect the experience of stress to be reduced (Bass & Bass, 2008; Diebig, Bormann, & Rowold, 2016; Dubinsky, Yammarino, Jolson, & Spangler, 1995; Seltzer, Numerof, & Bass, 1989; Sosik & Godshalk, 2000). Further, to the degree that the leader can project a positive outlook and vision, we would expect there to be some reassurance in times of stress and even some emotional contagion effects (Bono & Ilies, 2006; Erez et al., 2008; McColl-Kennedy & Anderson, 2002). Consequently, we would expect leadership behaviors associated with a clear, positive vision to both reassure subordinates and to allow them to deploy their resources more effectively. Transformational

leadership (Burns, 1975; Bass, 1985), which typically entails a positive outlook, providing a compelling vision to guide efforts, and being supportive of followers is therefore an appropriate operationalization of this set of behaviors (Bass & Bass, 2008).

H2A. Higher levels of transformational leadership will be negatively associated with higher levels of subordinate stress and burnout.

Perhaps even more importantly, to the degree that leaders can provide emotional support and material support, the resources associated with closer leader-follower bonds should also act to reduce subordinate stress and burnout (Bass & Bass, 2008; Lyons & Schneider, 2009). In addition, attachment theory postulates that leaders often serve as attachment figures for employees and that closer bonds should lead to reduced anxiety because individuals will have a “secure base” when trouble emerges (Harms, Bai, & Han, 2016). Indeed, there is meta-analytic evidence showing that supervisor support is an important antecedent of both work stress and feelings of burnout (Halbesleben, 2006; Viswesvaran et al., 1999). Thus, we would expect leadership variables associated with closer bonds to be associated with reduced feelings of stress. Leader-member exchange (LMX; Graen, 1976; Graen & Scandura, 1987; Graen & Uhl-bien, 1995), which assesses the quality of the relationship between leaders and followers, is an appropriate operationalization of the bond felt by a subordinate for their leader and the degree to which they believe they can count on them for support.

H2B. Higher levels of leader-member exchange will be negatively associated with higher levels of subordinate stress and burnout.

As noted above, although positive leadership behaviors may buffer other sources of stress, the leader themselves can be a significant source of stress themselves (Bass & Bass, 2008; Hogan & Kaiser, 2005; Rajah et al., 2011). For example, facing ongoing abuse from a supervisor is likely to drain psychological resources and may also be perceived as a potential threat to material resources or one's own person (Carlson, Ferguson, Hunter, & Whitten, 2012). In addition to the resource drain, the unpredictability associated with abusive leadership behaviors would require ongoing resources to monitor their relationships and surroundings (Harms, 2016; Matta et al., *in press*). Consequently, we would expect the destructive leadership behaviors displayed by leaders engaging in abusive supervision (Tepper, 2007) to result in both increased stress levels as well as a heightened need for vigilance that could lead to burnout symptoms such as emotional exhaustion (Chi & Liang, 2013; Han, Harms, & Bai, *in press*).

H2C. Higher levels of abusive supervision will be positively associated with higher levels of subordinate stress and burnout.

Method

Literature search

Potential sources for inclusion in this meta-analytic review were identified via keyword searches of the PsycINFO, Business Source Elite, and Dissertation Abstracts databases, complimented by detailed internet searches using the Google search engine. The keywords that were used in these searches were combinations of terms denoting the targeted forms of leadership (“transformational”, “LMX”, “leader-member exchange”, “abusive”, “authoritarian”, “autocratic”, “aversive”, “destructive”, “hostile”, “malevolent”, “negative”, “self-centered”, “toxic”, “tyrannical”) combined with terms for leadership (“leaders”, “leadership”, “managers”, “management”, “supervisor”, “supervision”) and with terms denoting stress and burnout (“stress”, “burnout”, “emotional exhaustion”, “cynicism”, and “personal accomplishment”). The results from these searches were further supplemented by examining the reference lists of identified articles and prior meta-analyses (e.g., Schyns & Schilling, 2013). The abstracts of all articles identified using this search strategy were examined by one of the authors in order to determine if the article might provide data based on the inclusion and exclusion criteria.

Inclusion and exclusion criteria

Studies were included in our review if they reported the zero-order correlations between the targeted leadership constructs and either stress or burnout – or reported data in a format that allowed computation of the zero-order correlation. Furthermore, studies were only included if they reported data based on employed individuals. That is, data from unemployed students was excluded. We also excluded data based on experimental manipulations of leadership, and data from studies that reported only on the consequences of stress (e.g., physical strains) but not on the appraisal of the workplace as stressful. In order to avoid the double inclusion of data we also excluded unpublished studies (e.g., dissertations) that were later published in a peer-reviewed journal. No limitations regarding the year in which the study was conducted or the country in which study was conducted were imposed.

Coding

All articles were coded twice by two of the authors with the few disagreements resolved via discussion. The only exception to this were articles written in Korean and German; these were coded only by one author. All coders have experience conducting meta-analytic reviews. For each article the following information was coded: 1) the correlation (r) between the leadership construct and either stress or burnout, 2) the sample size (N) associated with that correlation, 3) the reliability of scores on the

leadership variable, 4) the reliability of scores on the psychological consequence variable (stress or burnout), 4) the rating source of the leadership variable, 5) the rating source of the psychological consequences variable, 6) a brief description of the sample (e.g., industry and country), 7) the source of the article (peer-reviewed or not peer-reviewed), and 8) the year of publication. A complete summary of the resultant coding is provided in [Appendix A](#).

For studies that reported data for multiple forms of stress we coded work stress rather than non-work stress (Liu et al., 2010) and general feelings of stress rather than transitory instances of stress (Bono et al., 2007). For articles that reported on multiple types of workplace stress (e.g., stress measured using two different scales), or that reported only on the facets of burnout but not on overall burnout we computed unit-weighted composite correlations (Ghiselli, Campbell, & Zedeck, 1981) to estimate the relationship between the leadership variable and either overall stress or overall burnout whenever possible (e.g., Seltzer et al., 1989). When inter-correlations between the different types of stress or between the facets of burnout were not reported we computed averages of correlations instead (e.g., Madathil, 2010). Similarly we also computed unit-weighted composites and averages when studies reported on the facets of transformational leadership or the facets of LMX but not overall transformational leadership and overall LMX.

Final database

After the inclusion and exclusion criteria were applied and all necessary composites were calculated the final database was comprised of 243 correlations, from 157 independent samples representing 49,635 employees from 25 different countries.

Analytic approach

Meta-analytic estimates of the relationship between the leadership variables and the psychological consequences of burnout and stress were computed using the Schmidt and Le (2004) software package which is based on the Hunter and Schmidt (2004) interactive meta-analytic method and relies on a random effects model. As such this meta-analytic approach provides not only an estimate of the correlation between two variables in the absence of measurement error (i.e., unreliability in the measurement of either variable) but also provides estimates of the amount of variability in effect sizes that remains after taking into account the variability that is due to sampling error and other study artifacts such as unreliability of measurement. This value ($SD\rho$) can, in turn, be used as a direct indicator of the likelihood that the relationship between the two variables is characterized by substantive moderators; large values for $SD\rho$ indicating the likely presence of moderators. The Schmidt and Le software package provides two additional (related) indicators of the presence of moderators. First, it provides 80% credibility intervals that indicate the range of values of ρ in which 80% of all studies are likely to lie. That is, wide intervals indicate substantial variability in effect sizes even after accounting for the variability due to differences in sampling error and the reliability of measurement. Second, the software package also provides a percentage estimate of the amount of variability in observed effect sizes that can be attributed to sampling error and other study artifacts (i.e., unreliability in measurement in the case of this study). Small values for this estimate (Var%) are also indicative of the likely presence of substantive moderators or unexamined study artifacts.

Because not all studies reported local reliability estimates we used the reliability information that was provided for each construct across all examined studies to construct reliability distributions and used these reliability distributions to correct the distribution of observed correlations for unreliability in measurement as described by Hunter and Schmidt (2004). Summary information for these reliability distributions are provided in [Table 1](#).

We computed meta-analytic estimates of the relationship between leadership and stress/burnout for each leadership type and each stress/burnout construct separately. For the burnout construct we computed separate estimates for overall burnout and for each of the three most commonly studied facets of burnout. The vast majority of our data (144 out of 157 samples) was based on followers reporting on their own stress or burnout and their perceptions of their leaders but we were also able to compute some meta-analytic estimates of the relationship between leaders' stress and burnout on one hand and their leadership style on the other hand.

Table 1
Reliability artifact distributions for leadership variables and stress and burnout.

Variable	k_α	Mean α	SD_α
Transformational leadership	58	0.91	0.06
Leader-member exchange	40	0.89	0.07
Abusive supervision	40	0.89	0.08
Stress	71	0.85	0.06
Overall burnout	44	0.86	0.08
Depersonalization	20	0.77	0.08
Emotional Exhaustion	43	0.87	0.05
Low Personal Accomplishment	16	0.81	0.07

Note: k_α = number of reliability estimates for that variable, Mean α = average alpha estimates, SD_α = standard deviation of alpha estimates.

Results

Leader stress as an antecedent of leader behavior

Based on cognitive resource theory (Fiedler, 1989,1992), we expected that leader stress and/or burnout would be associated with lower levels of transformational leadership (Hypothesis 1A) and higher levels of abusive supervision behaviors (Hypothesis 1B). We were unable to locate any studies reporting on the relationship between leader stress and transformational leadership behaviors, but we did find some preliminary support for the proposed negative relationship with self-reported burnout ratings even though there were very limited studies to date on the subject (see Table 2). The overall burnout of leaders was not associated with their transformational leadership behaviors ($k = 5$, $N = 492$, $\rho = 0.00$, $SD_{\rho} = 0.33$) although the very large values for SD_{ρ} suggests the presence of substantial moderators. However, leader burnout at the facet level did exhibit substantial negative relationships with self-reported transformational leadership (Depersonalization ($\rho = -0.27$), Emotional Exhaustion ($\rho = -0.23$), Low Personal Accomplishment ($\rho = -0.50$). However, it should be noted that all three of these estimates were only based on two studies and data from 185 leaders.

For abusive supervision, the results were much clearer. For both same-source ($k = 2$, $N = 432$, $\rho = 0.39$, $SD_{\rho} = 0.19$) and different source samples ($k = 3$, $N = 471$, $\rho = 0.19$, $SD_{\rho} = 0.07$), there were substantial positive relationships between experienced stress and negative behaviors targeted at subordinates. However, it should be noted that these results were also based on a small number of studies and that there was some evidence for possible moderators in the size of the SD_{ρ} estimates and the width of the credibility intervals.

Leader behavior as a cause of subordinate stress and burnout

Based on conservation of resource theory and attachment theory, we argued that higher levels of transformational leadership and LMX would be associated with lower levels of stress and burnout among subordinates (Hypothesis 2A) and that higher levels of abusive supervision would be associated with higher levels of stress and burnout among subordinates (Hypothesis 2B). These hypotheses were strongly supported by the data gathered from the existing literature (see Table 3). Transformational leadership was negative associated with both subordinate stress ($k = 34$, $N = 13,105$, $\rho = -0.28$, $SD_{\rho} = 0.17$) and overall subordinate burnout ($k = 25$, $N = 6329$, $\rho = -0.32$, $SD_{\rho} = 0.09$) although the relatively large values for SD_{ρ} suggest the presence of moderators. Transformational leadership also exhibited modest negative relationships with each facet of subordinate burnout: $\rho = 0.23$ for depersonalization ($k = 11$, $N = 3391$, $SD_{\rho} = 0.12$), $\rho = -0.26$ for emotional exhaustion ($k = 20$, $N = 6905$, $SD_{\rho} = 0.06$), and $\rho = -0.22$ ($k = 10$, $N = 3031$, $SD_{\rho} = 0.07$) for low personal accomplishment. This pattern was repeated with higher levels of LMX being associated with reduced subordinate stress ($k = 22$, $N = 6861$, $\rho = -0.35$, $SD_{\rho} = 0.15$) and subordinate burnout ($k = 18$, $N = 4510$, $\rho = -0.45$, $SD_{\rho} = 0.08$) and each of the facets of subordinate burnout. In general the relationship of LMX with both stress and burnout among subordinates was stronger than the relationships of transformational leadership with subordinate stress and burnout. Indeed, a comparison of all pairs of correlations using Fisher's r -to- z transformations showed that LMX related significantly more strongly with stress, burnout, and all three burnout facets among subordinates than did transformational leadership (at $p < 0.01$). This suggests that LMX may be a more effective buffer against subordinate stress and subordinate burnout than transformational leadership, although it should be noted that the relatively strong relationship between LMX and burnout largely disappeared when ratings of follower stress were matched with leader ratings of LMX ($k = 6$, $N = 708$, $\rho = -0.05$, $SD_{\rho} = 0.18$).

For abusive supervision, we found the expected positive relationships with higher reported levels of subordinate stress ($k = 13$, $N = 4940$, $\rho = 0.22$, $SD_{\rho} = 0.24$), subordinate burnout ($k = 9$, $N = 2570$, $\rho = 0.36$, $SD_{\rho} = 0.10$) and each of the facets of subordinate burnout: depersonalization ($k = 4$, $N = 1222$, $\rho = 0.55$, $SD_{\rho} = 0.11$), emotional exhaustion ($k = 22$, $N = 8585$, $\rho = 0.35$, $SD_{\rho} = 0.13$), and low personal accomplishment ($k = 2$, $N = 631$, $\rho = 0.48$, $SD_{\rho} = 0.18$). For all relationship involving abusive supervision the wide credibility intervals and large values for SD_{ρ} suggest the presence of moderators.

Table 2
Meta-analytic results for relationship of leadership variables with leader stress and burnout.

Source	Target	Leadership	Predictor	k	N	r_{obs}	SD_{obs}	ρ	SD_{ρ}	10% CV	90% CV	Var%	2.5% CI	97.5% CI
Same	Leaders	TL	Overall burnout	5	492	0.00	0.30	0.00	0.33	-0.42	0.42	11	0.00	0.00
Same	Leaders	TL	Burnout - DP	2	185	-0.22	0.00	-0.27	0.00	-0.27	-0.27	100	-0.27	-0.27
Same	Leaders	TL	Burnout - EE	2	185	-0.20	0.00	-0.23	0.00	-0.23	-0.23	100	-0.23	-0.23
Same	Leaders	TL	Burnout - LPA	2	185	-0.43	0.05	-0.50	0.05	-0.56	-0.43	79	-0.58	-0.42
Same	Leaders	AS	Stress	2	432	0.34	0.17	0.39	0.19	0.14	0.64	12	0.12	0.66
Different	Leaders	AS	Stress	3	471	0.17	0.06	0.19	0.07	0.10	0.28	62	0.11	0.27

Note: Note. k = number of studies, N = number of subjects, r_{obs} = sample size weighted mean observed correlation, SD_{obs} = standard deviation of observed effect sizes, ρ = true score correlation, SD_{ρ} = standard deviation of true score correlations, 10%CV and 90%CV = lower and upper bound of 80% credibility intervals, Var% = percentage of observed variance in effect sizes that can be attributed to study.

Table 3

Meta-analytic results for relationship of leadership variables with subordinate stress and burnout.

Source	Target	Leadership	Criterion	k	N	r_{obs}	SD_{obs}	ρ	$SD\rho$	10% CV	90% CV	Var %	2.5% CI	97.5% CI
Same	Followers	TL	Stress	34	13,105	-0.25	0.15	-0.28	0.17	-0.49	-0.07	10	-0.34	-0.22
Same	Followers	TL	Overall burnout	25	6329	-0.28	0.09	-0.32	0.09	-0.44	-0.20	35	-0.36	-0.28
Same	Followers	TL	Burnout - DP	11	3391	-0.19	0.10	-0.23	0.12	-0.37	-0.08	25	-0.30	-0.16
Same	Followers	TL	Burnout - EE	20	6905	-0.23	0.05	-0.26	0.06	-0.33	-0.19	53	-0.28	-0.24
Same	Followers	TL	Burnout -LPA	10	3013	-0.19	0.06	-0.22	0.07	-0.31	-0.13	45	-0.26	-0.18
Same	Followers	LMX	Stress	22	6861	-0.30	0.13	-0.35	0.15	-0.54	-0.15	14	-0.41	-0.29
Different	Followers	LMX	Stress	6	708	-0.04	0.16	-0.05	0.18	-0.28	0.18	26	-0.21	0.11
Same	Followers	LMX	Overall burnout	18	4510	-0.39	0.08	-0.45	0.08	-0.55	0.34	40	-0.49	-0.41
Same	Followers	LMX	Burnout - DP	8	2060	-0.41	0.16	-0.50	0.19	-0.73	0.26	12	-0.64	-0.36
Same	Followers	LMX	Burnout - EE	9	2246	-0.31	0.20	-0.35	0.22	-0.64	-0.06	8	-0.50	-0.20
Same	Followers	LMX	Burnout -LPA	6	750	-0.27	0.48	-0.33	0.56	-0.00	0.39	3	-0.80	0.14
Same	Followers	AS	Stress	13	4940	0.19	0.21	0.22	0.24	-0.09	0.53	5	0.09	0.35
Same	Followers	AS	Overall burnout	9	2570	0.31	0.10	0.36	0.10	0.23	0.49	28	0.28	0.44
Same	Followers	AS	Burnout - DP	4	1222	0.45	0.10	0.55	0.11	0.41	0.69	26	0.43	0.67
Same	Followers	AS	Burnout - EE	22	8585	0.30	0.11	0.35	0.13	0.18	0.51	16	0.30	0.40
Same	Followers	AS	Burnout -LPA	2	631	0.40	0.15	0.48	0.18	0.25	0.70	11	0.23	0.73

Note: Note. k = number of studies, N = number of subjects, r_{obs} = sample size weighted mean observed correlation, SD_{obs} = standard deviation of observed effect sizes, ρ = true score correlation, $SD\rho$ = standard deviation of true score correlations, 10%CV and 90%CV = lower and upper bound of 80% credibility intervals, Var% = percentage of observed variance in effect sizes that can be attributed to study.

Discussion

On the whole then, our expectations concerning the relationship between leadership and stress were largely confirmed. Based on prior studies and theory, we expected that leader stress would be associated with poorer leadership because it would drain cognitive and emotional resources and make it difficult for leaders to function effectively in their role. Moreover, we expected that the frustration associated with ongoing stress may cause some leaders to lash out in a destructive manner towards some of their subordinates. Our meta-analysis found some support for this in that higher levels of stress and burnout were associated with lower levels of transformational leadership and higher levels of abusive supervision. However, the majority of this data was same source. Hence, causal assertions must be made with caution. It is possible that engaging in abusive supervisory behaviors can create leader stress. In other words, this could be a reciprocal relationship or that causality could be reversed.

We also anticipated that positive leadership behaviors such as providing a vision and communicating a positive outlook would serve as a positive buffer against stress and burnout in subordinates. Likewise, we suggested that closer ties between leaders and followers would make followers more certain of the social and material resources available to them to deal with the potential or ongoing threats that might induce feelings of stress and burnout. On the other hand, we argued that destructive leadership behaviors that hurt subordinates and made it necessary for them to be vigilant against their supervisor would lead to greater feelings of stress and burnout. That is, taken as a whole, leadership behaviors could both help and hurt the well-being of employees depending on which ones were more frequently displayed by a leader. We found substantial support that this was the case. Higher levels of transformational leadership and LMX were associated with subordinates reporting lower stress and burnout while higher levels of abusive supervision were associated with higher levels of subordinate stress and burnout. Again, it should be noted that the majority of the data is same source, which muddles causal ordering. Similar to the data on leader stress, it may be that an employee experiencing high levels of stress is more likely to perceive or report abusive supervision (as opposed to abusive supervision driving stress; Wang, Harms, & Mackey, 2015). Also, it is possible that highly stressed employees are less likely to perceive high levels of LMX.

Interestingly, we generally found larger effects for the two more relational leadership constructs, LMX and abusive supervision, than we did for transformational leadership. Although it is not possible to parse out exactly why this is the case in the current study, it suggests that violations or reassurances of relationship quality may be more important than the abstract, cognitive components of leadership (e.g. inspirational motivation, intellectual stimulation) found in transformational leadership. If true, we would anticipate that the “showing consideration” component of transformational leadership would show the strongest relationships with stress and well-being outcomes. Unfortunately, because most authors report aggregated transformational leadership scores instead of the representative subcomponents, this analysis was not possible.

A second interesting pattern in the results replicates a finding noted by Bass in earlier work (Bass & Bass, 2008; Seltzer et al., 1989) concerning the relative size of the relationship between leadership and stress or burnout outcomes. Specifically, that although burnout is defined as being more extreme than stress, it generally shows higher relationships with leader behavior than does stress. We also found that this was the case for each of our leadership constructs. One potential reason for this may be that a number of stress measures use transitory language (e.g. how are you feeling at this very moment?) rather than reflecting a more chronic state in the way that burnout does. Because one's relationship with a leader endures over time and the individual is unlikely to have experienced jolting changes just before taking surveys, short-term-based assessments of emotional well-being may underestimate the size of the relationship with leadership behaviors. Regardless of the reason, our review made clear that extensive work needs to be done concerning more firmly establishing the causal direction between leadership and reported well-being. Most of the studies that we surveyed were entirely reliant on same-source, concurrent design and in these circumstances, it leaves open the possibility that at least some of the observed effects could be attributed to rater biases

driven by trait affect (Wood, Harms, & Vazire, 2010) or other common-source method effects (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Implications and future directions

Although it could be argued that the current results are not too surprising, they are nonetheless further evidence of the importance of leadership in the workplace. In particular, they serve as a reminder of the central role played by leaders in the health and well-being of their followers. In other words, the present results represent an important step towards revealing the nature of the relationship between emotional experiences and leadership (Rajah et al., 2011). At the same time, it should be apparent that the present meta-analysis is in many ways just a starting point for future research on this topic. Indeed, the present results are suggestive of a number of directions where future research is needed to draw firmer conclusions.

The present results were based on a relatively small set of studies. This meant that the range of leadership constructs that was able to be assessed was fairly limited. In particular, we would suggest that future research not just examine newer leadership constructs such as ethical leadership (Brown & Trevino, 2006), but also older ones such as initiating structure and showing consideration (Halpin, 1957) that have been shown to out-predict more “advanced” leadership styles such as transformational leadership when it comes to emotion-based outcomes like satisfaction with one’s leader (DeRue, Nohrman, Wellman, & Humphrey, 2011).

Another very interesting potential area of concern is the role individual and environmental factors as moderators of the relationships between leadership and stress. There is extensive evidence that such moderators are present in the broader stress and burnout literature (Halbesleben & Buckley, 2004), but they remain relatively unexplored in the leadership context itself. It is well-established that a wide variety of personality traits are predictive of an individual’s tendency to report being stressed or burnt out (e.g. Alarcon, Eschleman, & Bowling, 2009). Less well-established is the degree to which stress moderates these associations. For example, prior research has argued that personality traits such as neuroticism, disagreeableness, and tendency to perceive hostility can all lead individuals to be more reactive to stress as well as to perceive the behaviors of others in a hostile manner (Brees, Martinko, & Harvey, 2016; Taylor & Kluepfer, 2012). Moreover, previous research has suggested that stress can moderate the relationship between leadership styles and antecedent personality traits such as extraversion and openness (Oreg and Berson, 2015), neuroticism and locus of control (De Hoogh & Den Hartog, 2009), and emotion regulation capacity (Bono, Foldes, Vinson, & Muros, 2007). Other resource-building traits such as self-efficacy, secure attachment, hardiness, and resilience (Bartone, 2006; DeSimone, Harms, Vanhove, & Herian, in press; Harms, 2011; Jex & Bliese, 1999) have been suggested as potential moderators of stress in the workplace, as have darker, more emotionally-reactive ones such as narcissism and psychopathy (Spain et al., in press), but the evidence to date is extremely limited. Other factors having to do with national culture (e.g. power distance), organizational culture (e.g. military vs civilian), or specific job roles could determine how appropriate certain leadership behaviors, and particularly harsh ones, were seen to be or how much they were expected. For example, could the problems being faced by the U.S. military with regards to the prevalence of toxic leadership be something of a result of a culture that encourages or tolerates harsh, directive behaviors (Steele, 2011).

One final promising area for research concerns the topic of leadership development. If perceptions of stress and reactions to ongoing stress are major drivers of leadership behaviors which, in turn, impact subordinate well-being and performance, it would seem that organizations concerned with leadership effectiveness now have evidence that leadership development could be done through addressing the stress factor. In particular, we now know a great deal about the effectiveness of resilience-building programs such as the Penn Resiliency Program (Gillham et al., 1990) and the Army’s Battlemind program (Adler, Bliese, McGurk, Hoge, & Castro, 2009) in terms of what factors are associated with building psychological and social resources that can withstand stress (Vanhove et al., 2016). Based on the current results, it would seem wise for organizations to integrate such training into leadership development programs with the aim of making leaders better capable of operating under stress. Similar programs could be initiated for subordinates as well.

In addition to promising future research, our results point to several practical implications for organizational leaders. Primarily, our results suggest that visible actions such as LMX associated behaviors and abuse are just as, if not more powerful, than leadership style when managing subordinate stress. This emphasizes the importance of direct leader-subordinate interactions and the influence of visible actions on the psyche of subordinates. Future training should focus on how leaders can broadcast effective behaviors to reduce subordinate stress. Additionally, the three facets of burnout were negatively related to self-reported transformational leadership with low personal accomplishment showing the strongest negative relationship. As such, it is likely that organizations should reinforce positive behaviors and emphasize individual accomplishment of their leaders in order to reduce negative perceptions of one’s work and effort. This should translate into a higher likelihood of taking a transformational approach to leadership. Finally, the findings show that, as expected, leader stress drives future behaviors. Training targeted at increasing leader resilience, developing effective coping strategies, and general stress management will be effective at driving leadership behaviors and, subsequently, follower stress.

Conclusion

The present results supported the notion that leadership behaviors were impacted by whether leaders were experiencing stress or not. Moreover, that the positive and negative behaviors enacted by leaders and the relationships they developed with subordinates were significant determinants of subordinate stress outcomes. We hope that this meta-analysis will serve not only to benchmark the expected size of these relationships in future research, but to also be suggestive of future research concerning the boundary conditions of these relationships. Finally, we believe that the evidence presented here is suggestive of new

directions in leadership development training programs. We can't stress enough our hope that this analysis will lead to better working conditions for both leaders and followers and improve our capacity to develop better leaders.

Appendix A. Summary of meta-analytic coding

Appendix

Summary of meta-analytic coding

Authors	N	Publication	Source	Focus?	Leadership		Stress		Burnout		Deperson.		Emot. Ex.		Low PA	
					Type	α	r	α	r	α	r	α	r	α	r	α
Ali (2015)	203	Diss.	Same	Followers	TL	.90							-.18	.83		
Altafayneh (2003) - Sample 1	42	Diss.	Same	Leaders	AS	.73					.20	.87	.47	.83	.45	.85
Altafayneh (2003) - Sample 2	413	Diss.	Same	Followers	AS	.71					.56	.77	.47	.82	.52	.81
Ambrose (2009)	792	Diss.	Same	Followers	TL	.89	-.74									
Arnold, Connelly, Walsh, & Martin Ginis (2015)	205	Journal	Same	Leaders	TL	.95			.32	.87						
Aryee, Sun, Chen, & Debrah (2008)	285	Journal	Same	Followers	AS	.88							.35	.88		
Ashforth (1997) - Sample 1	88	Journal	Same	Followers	AS		.26	.81								
Ashforth (1997) - Sample 2	76	Journal	Same	Followers	AS		.30	.85								
Baek (2007)	244	Diss.	Same	Followers	LMX	.95	-.36	.89								
Ballard (2012)	88	Diss.	Same	Followers	TL				-.42							
Bamberger & Bacharach (2006)	1473	Journal	Same	Followers	AS	.87	.02	.91								
Bardes (2009)	257	Diss.	Same	Leaders	AS	.96	.19	.81								
Beason (2015)	214	Diss.	Same	Followers	LMX	.87	-.14	.98								
Becker, Halbesleben & O'Hair (2005)	81	Journal	Same	Followers	LMX	.95			-.58	.93	-.55	.87	-.48	.92		
Belenko (2011)	111	Diss.	Same	Followers	TL	.95	-.28	.84	-.39	.88						
Bernas & Major (2000)	206	Journal	Same	Followers	LMX	.91	-.47	.95								
Bitmis & Ergeneli (2012)	490	Journal	Same	Followers	LMX	.96	-.36	.88								
Boerner, Dutschke, & Wied (2009)	142	Journal	Same	Followers	TL	.91			-.08	.65						
Bono, Foldes, Vinson & Muros (2007)	54	Journal	Same	Followers	TL	.93	-.25	.79								
Breaux, Perrewé, Hall, Frink, & Hochwarter (2008)	366	Journal	Same	Followers	AS	.92	.28	.87					.31	.80		
Burton, Hoobler, & Scheuer (2012)	98	Journal	Different	Leaders	AS	.91	.21	.85								
Carlson, Ferguson, Hunter, & Whitten (2012)	328	Journal	Same	Followers	AS	.98							.36	.78		
Cha et al. (2010)	482	Journal	Same	Followers	LMX	.94	-.26	.91								
Chambel, Castanheira, Oliveira-Cruz, & Lopes (2015)	1045	Journal	Same	Followers	LMX	.92			-.33	.87	-.32	.74	-.25	.85		
Chen & Tjosvold (2013)	102	Journal	Different	Followers	LMX	.87	-.03	.89								
Chen (2011)	137	Diss.	Same	Followers	AS	.96							.52	.91		
Chi & Liang (2013)	254	Journal	Same	Followers	AS	.97							.46	.86		
Cho (2005)	3117	Diss.	Same	Followers	TL	.80	-.20	.79								
Chuang (2008)	176	Diss.	Same	Followers	TL	.98	.20	.89								
Cole & Bedeian (2007)	780	Journal	Same	Followers	TL								-.31	.90		
Collier (2004)	44	Diss.	Same	Followers	TL				-.30		-.21		-.51		-.19	
Comber (2014)	262	Diss.	Same	Followers	TL		.08									
Corrigan, Diwan, Campion & Rashid (2002)	620	Journal	Same	Followers	TL				-.17		-.12		-.21		-.18	
Corrigan, Diwan, Campion & Rashid (2002)	54	Journal	Same	Leaders	TL				-.22		-.21		-.18		-.27	
Courtright, Colbert, & Choi (2014)	153	Journal	Same	Leaders	TL	.94							-.10	.88		
Cummings & Nall (1982)	16	Journal	Same	Followers	AS	.89				.59						
Daenzer (2009)	32	Diss.	Same	Followers	TL		-.28									
De Hoogh & Den Hartog (2009) - Sample 1	91	Journal	Same	Followers	AS	.70			.21	.92						
De Hoogh & Den Hartog (2009) - Sample 2	190	Journal	Same	Followers	AS	.70			.25	.90						
Dhaliwal (2008) - Sample 1	37	Diss.	Same	Followers	TL		-.50									
Dhaliwal (2008) - Sample 2	180	Diss.	Same	Followers	TL		-.22									
Dilshani (2015)	200	Conf.	Same	Followers	LMX						-.81	.76	-.82	.85	-.88	.93
Dubinsky, Yammarino, Jolson, & Spangler (1995)	174	Journal	Same	Followers	TL	.97	-.22	.80	-.27	.93						
Ebrahimzade, Mooghali, Lankarani, & Sadati (2015)	207	Journal	Same	Followers	TL	.80			-.15		-.16	.81	-.17	.73	-.06	.70
Eghdamy, Ganjiniya & Akhlagh (2013)	220	Journal	Same	Followers	TL				-.37		-.29		-.34		-.31	
Elangovan & Xie (2000)	165	Journal	Same	Followers	AS	.90	.34	.88								
Exantus (2011)	32	Diss.	Same	Leaders	TL				-.09							
Eyal & Roth (2011)	122	Journal	Same	Followers	TL	.84			-.21	.94						
Fernet, Trépanier, Austin, Gagné, & Forest (2015) - Sample 1	637	Journal	Same	Followers	TL	.94	-.32	.83	-.40	.83						

Appendix (continued)

Authors	N	Publication	Source	Focus?	Leadership		Stress		Burnout		Deperson.		Emot. Ex.		Low PA	
					Type	α	r	α	r	α	r	α	r	α	r	
Fernet, Trépanier, Austin, Gagné, & Forest (2015) - Sample 2	210	Journal	Same	Followers	TL	.93	-.21	.78								
Fox & Stallworth (2010)	759	Journal	Same	Followers	AS	.92			.28	.91						
Gill & Flaschner & Shachar (2006) - Sample 1	89	Journal	Same	Followers	TL	.93	-.53	.87								
Gill & Flaschner & Shachar (2006) - Sample 2	45	Journal	Same	Followers	TL	.93	-.27	.87								
Gill, Flaschner, & Bhutani (2010)	264	Journal	Same	Followers	TL	.88	-.26	.84								
Gkorezis, Petridou & Kroukaidou (2015)	122	Journal	Same	Followers	AS	.94						.51	.89			
Gordick (2002)	243	Diss.	Same	Followers	TL	.96	-.16	.85								
Graham & van Witteloostuijn (2010)	128	Journal	Same	Followers	LMX	.93			-.32	.89	-.28	.74	-.22	.88	-.17	.88
Grandey, Kern, & Frone (2007) - Sample 1	2446	Journal	Same	Followers	AS								.18			
Grandey, Kern, & Frone (2007) - Sample 2	121	Journal	Same	Followers	AS								.39			
Green, Albanese, Shapiro, Aarons (2014)	285	Journal	Same	Followers	TL	.94			-.30	.87	-.19	.65	-.23	.90	-.27	.74
Green, Miller & Aarons (2011)	388	Journal	Same	Followers	TL	.95							-.30	.91		
Han, Harms, & Bai (2015)	222	Journal	Same	Followers	AS	.89							.33	.88		
Harms, Lester, & Weber (2009)	340	Journal	Different	Followers	TL	.97	-.23	.70								
Harris & Kacmar (2006) - Sample 1	120	Journal	Same	Followers	LMX	.89	-.14	.87								
Harris & Kacmar (2006) - Sample 2	402	Journal	Same	Followers	LMX	.90	-.32	.83								
Harvey, Stoner, Hochwarter, & Kacmar (2007)	715	Journal	Same	Followers	AS	.88	.18	.82					.22	.87		
Hawks (2004)	463	Diss.	Same	Followers	TL	.91	-.16	.87	-.25	.88	-.20	.69	-.16	.86	-.22	.76
Hesselgreaves & Scholarios (2014) - Sample 1	46	Journal	Different	Followers	LMX	.86	-.18	.88								
Hesselgreaves & Scholarios (2014) - Sample 2	70	Journal	Different	Followers	LMX	.86	-.18	.91								
Hetland, Sandal, Johnsen (2007)	289	Journal	Same	Followers	TL	.92			-.32	.89	-.32	.77	-.12	.82	-.29	.85
Huang et al. (2010)	493	Journal	Same	Followers	LMX	.86			-.40	.93						
Jiang, Law, & Sun (2014)	218	Journal	Same	Followers	LMX	.88			-.19	.93	-.35	.87	.02	.90		
Kanste, Kyngas, & Nikkila (2007)	601	Journal	Same	Followers	TL	.96					-.13	.83	-.15	.87	-.08	.81
Kara et al. (2013)	443	Journal	Same	Followers	TL	.95			-.23	.76						
Kim (2010)	458	Diss.	Same	Followers	TL	.95	-.40	.91								
Kim (2011)	200	Diss.	Same	Followers	TL	.95	-.24	.92								
Kirkbesoglu & Tuzlukaya (2014) - Sample 1	83	Journal	Same	Followers	LMX	.69			-.35	.66						
Kirkbesoglu & Tuzlukaya (2014) - Sample 2	98	Journal	Same	Followers	LMX	.70			-.24	.72						
Kumar, Singh, Rai, & Bhattacharya (2012)	192	Journal	Same	Followers	LMX	.85			-.41	.89						
La Falce (2012)	172	Diss.	Same	Followers	TL	.84	-.22	.90								
Lagace (1987)	83	Diss.	Same	Followers	LMX	.90	-.59									
Lam & O'Higgins (2012)	323	Journal	Mixed	Followers	TL	.90	-.11	.62								
Larson (2006)	79	Diss.	Same	Followers	LMX	.95			-.80	.80	-.74	.72	-.67	.90	.82	.80
Lawrence & Kacmar (2012) - Sample 1	418	Journal	Same	Followers	LMX	.90	-.31	.77								
Lawrence & Kacmar (2012) - Sample 2	134	Journal	Same	Followers	LMX	.89	-.15	.88								
Layton (2003)	478	Diss.	Same	Followers	TL		-.20									
Lee & Kim (2012)	300	Journal	Same	Followers	TL		-.12									
Lee (2007)	178	Diss.	Same	Followers	LMX	.93	-.36	.89								
Lee (2011a)	151	Journal	Same	Followers	LMX	.94			-.37	.86	-.34	.68	-.19	.87	-.23	.85
Lee (2011b)	250	Diss.	Same	Followers	TL	.72	-.15	.80								
Leithwood, Menzies, Jantzi, Leithwood (1996)	331	Journal	Same	Followers	TL	.92			-.26	.78						
Li, Qian, Han, and Jin (2015)	248	Journal	Same	Followers	AS	.73			.23	.71						
Liu, Siu & Shi (2010)	745	Journal	Same	Followers	TL	.98	-.18	.82								
Luthiger (2008) - Sample 1	96	Diss.	Same	Followers	LMX	.82	-.35	.94								
Luthiger (2008) - Sample 2	58	Diss.	Same	Followers	LMX	.79	-.37	.94								
Madathil, Heck, & Schuldberg (2014)	80	Journal	Same	Followers	TL	.96			-.37	.87	-.19	.61	-.37	.92	-.34	.74
Maricle (2013)	70	Diss.	Same	Leaders	TL				.10							
Mawritz, Folger and Latham (2014)	215	Journal	Different	Leaders	AS	.88	.06	.84								
Mehta (2009)	330	Diss.	Same	Followers	LMX	.89	.08	.93								
Nelson (2014)	186	Diss.	Same	Followers	LMX								-.30			
Nelson (2014)	186	Diss.	Same	Followers	TL								-.35			
Nufer (2012) - Sample 1	226	Diss.	Same	Followers	LMX	.90	-.18	.85	-.46	.88						
Nufer (2012) - Sample 2	260	Diss.	Same	Followers	LMX	.87	-.17	.85	-.42	.74						
Nyberg et al. (2011)	503	Journal	Same	Followers	AS	.91	.28	.88								

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Appendix (continued)

Authors	N	Publication	Source	Focus?	Leadership		Stress		Burnout		Deperson.		Emot. Ex.		Low PA	
					Type	α	r	α	r	α	r	α	r	α	r	α
Ozer, Chang, and Schaubroeck (2014)	258	Journal	Different	Followers	LMX		-.17	.93								
Palm (2007)	291	Diss.	Same	Followers	TL	.85			-.24	.83						
Park (2004)	206	Diss.	Same	Followers	TL	.92	-.28	.78								
Park (2013)	1233	Diss.	Same	Followers	LMX	.90	-.47	.90								
Perko, Kinnunen, Tolvanen, Feldt (2016)	262	Journal	Same	Followers	AS	.91						.11	.87			
Perko, Kinnunen, Tolvanen, Feldt (2016)	262	Journal	Same	Followers	TL	.90						-.23	.85			
Pillai & Meindl (1998)	463	Journal	Same	Followers	TL	.96	-.26	.76								
Pinkus-Huizenga (2015)	116	Diss.	Same	Followers	TL	.93	-.06	.93								
Rad and Ghalenoi (2013)	218	Journal	Same	Followers	AS				.36		.32	.33		.18		
Rad and Ghalenoi (2013)	42	Journal	Same	Leaders	AS				.14		-.31	-.01		.41		
Rafferty, Lloyd, Restubog, and Jimmieson (2010) - Sample 1	175	Journal	Same	Followers	AS	.97	.64	.82								
Rafferty, Lloyd, Restubog, and Jimmieson (2010) - Sample 2	175	Journal	Same	Leaders	AS	.97	.56	.79								
Rittschof (2013)	204	Diss.	Same	Followers	TL	.97			-.08	.91	.09	.81	-.15	.91	-.13	.80
Rome (1999)	655	Diss.	Same	Followers	TL	.68							-.26	.92		
Rooney, Gottlieb, and Newby-Clark (2008)	247	Journal	Same	Followers	AS	.87	.31	.83								
Rose (1997)	312	Diss.	Same	Followers	LMX	.93			-.41	.91						
Rowold and Heinitz (2008) - Sample 1	101	Journal	Same	Followers	TL	.89	-.13									
Rowold and Heinitz (2008) - Sample 2	1311	Journal	Same	Followers	TL	.95	-.25									
Russell (2011) - Sample 1	41	Diss.	Same	Followers	TL		-.37		-.19							
Russell (2011) - Sample 2	388	Diss.	Same	Followers	TL	.96	-.27	.95	-.33	.87						
Salem (2015)	327	Journal	Same	Followers	TL	.93	-.39	.85								
Second Author (2016)	425	Unpub.	Same	Followers	AS		-.16									
Seltzer, Numerof and Bass (1989)	277	Journal	Same	Followers	TL	.96			-.52	.94						
Sheuer (2013)	273	Diss.	Same	Followers	AS	.93						.27	.83			
Sheuer (2013) - Sample 1	243	Diss.	Same	Followers	AS	.90	.35	.77								
Sheuer (2013) - Sample 2	273	Diss.	Same	Followers	AS	.93	.75	.95								
Shi, Zhang, Xu, Liu, and Miao (2015)	378	Journal	Same	Followers	TL	.89					-.39	-.30				
Smith (2002)	150	Diss.	Same	Followers	LMX	.96	-.21	.92								
Smith (2012)	142	Diss.	Same	Followers	TL	.97			-.59	.93						
Son, Kim, and Kim (2014)	158	Journal	Same	Followers	LMX	.89			-.53	.92	-.50	.73	-.41	.90	-.31	.95
Sosik and Godshalk (2000)	204	Journal	Different	Followers	TL	.78	-.09	.80								
Sparks (2012)	457	Diss.	Same	Followers	AS	.92			.23	.94						
Sparks (2012)	457	Diss.	Same	Followers	LMX	.95			-.41	.94						
Spence Laschinger and Fida (2014)	342	Journal	Same	Followers	AS	.80			.56	.72	.50	.85	.49	.92		
Stokes (2013)	178	Diss.	Same	Followers	TL	.91			-.26	.76						
Stordeur, D'hoore, and Vandenberghe (2001)	625	Journal	Same	Followers	TL	.97							-.19	.87		
Syrek, Apostel, and Antoni (2013)	262	Journal	Same	Followers	TL	.95							-.26	.83		
Tepper (2000)	362	Journal	Same	Followers	AS	.90							.36	.86		
Thomas & Lankau (2009) - Sample 1	218	Journal	Same	Followers	LMX	.91	-.46	.83	-.31	.96						
Thomas & Lankau (2009) - Sample 2	204	Journal	Same	Followers	LMX	.91	-.51	.83	-.47	.96						
Tummers & Bronkhorst (2014)	334	Journal	Same	Followers	LMX	.92	-.31	.72								
Twigg and Kang (2011)	295	Journal	Same	Followers	TL	.92			-.27	.91						
Wang and Yi (2011)	548	Journal	Same	Followers	LMX	.79	-.16	.87								
Whitman, Halbesleben, & Holmes (2014) - Sample 1	463	Journal	Same	Followers	AS	.95						.31	.90			
Whitman, Halbesleben, & Holmes (2014) - Sample 2	220	Journal	Same	Followers	AS	.93						.50	.91			
Woestman (2014)	191	Diss.	Same	Followers	AS		.16									
Wong (2008) - Sample 1	147	Diss.	Same	Followers	TL	.93			-.24							
Wong (2008) - Sample 2	188	Diss.	Same	Followers	TL	.91			-.34							
Wu and Cao (2015)	339	Journal	Same	Followers	AS	.97						.55	.78			
Wu & Hu (2009)	290	Journal	Same	Followers	AS	.95						.26	.81			
Wu (2010) - Sample 1	102	Diss.	Different	Followers	LMX	.95	-.03	.80								
Wu (2010) - Sample 2	130	Diss.	Different	Followers	LMX	.72	.32	.84								
Yagil (2006)	249	Journal	Same	Followers	AS	.90			.35	.82	.32	.74	.35	.74	.05	.74
Yildiz (2011)	107	Journal	Same	Followers	LMX				-.44							
Yoo & Han (2005)	316	Journal	Same	Followers	LMX	.93	-.24	.91								
Zhang (2013)	158	Diss.	Different	Leaders	AS	.95	.28	.93								
Zhang (2013)	158	Diss.	Different	Leaders	TL	.94	-.20	.93								
Zopiatis and Constanti (2010)	131	Journal	Same	Leaders	TL	.84			-.42	.89	-.23	.83	-.21	.91	-.49	.73

Note: Diss. = dissertation, Unpub. = unpublished dataset, Source = same if leadership rating and consequence rating came from same source, focus = followers if the stress/burnout ratings referred to the stress/burnout of followers, AS = abusive leadership, LMX = leader-member exchange, TL = transformational leadership, Deperson. = depersonalization, Emot. Ex. = Emotional Exhaustion, Low PA = Low Personal Accomplishment, α = local internal consistency estimate, r = correlation between leadership rating and stress/burnout scores in that sample.

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