

**A META-ANALYSIS OF TRANSFORMATIONAL LEADERSHIP AND TASK
PERFORMANCE: EXPLORING THE MEDIATING ROLE OF CORE JOB
CHARACTERISTICS**

by

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DEDICATION

This thesis is dedicated to my mother and father. Thank you for providing me with unconditional support.

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The present study examines the bright and dark sides of transformational leadership for follower task performance. Drawing from social information processing theory (Salancik & Pfeffer, 1978) and self-determination theory (SDT; Ryan & Deci, 2000a). I propose that the benefits and costs of transformational leadership for follower task performance are shaped by the mechanisms of five core job characteristics (Hackman & Oldham, 1976), intrinsic motivation, and perceived role overload. I further propose that the effect of transformational leadership on core job characteristics is stronger within the uncertain environment. In general, results revealed that transformational leadership had positive indirect relationships with task performance through core job characteristics by increasing intrinsic motivation and reducing perceived role overload, and had negative indirect effects on task performance through two of the five core job characteristics (job autonomy and task significance) and subsequent perceived role overload. Results also supported the predicted moderating effect. The theoretical and practical implications of these findings are discussed.

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CHAPTER 1: INTRODUCTION

There is a multitude of research examining the relationships between transformational leadership and follower task performance (for meta-analytic reviews, see Judge & Piccolo, 2004; Wang, Oh, Courtright, & Colbert, 2011). The overall positive association of transformational leadership with follower task performance established by previous research (e.g., Keller, 1992; Kirkpatrick & Locke, 1996; Yammarino, Spangler, & Bass, 1993) suggests the possibility that certain mechanisms explain the overall effect. One mechanism that has received considerable attention in the last decade is how transformational leadership affects follower task performance through work characteristics (for a list of work characteristics, see Humphrey, Nahrgang, & Morgeson, 2007; Parker, Wall, & Cordery, 2001). The interest in the mechanism of work characteristics is partly because transformational leadership behaviors shape followers' perceptions of their jobs (Purvanova, Bono, & Dzieweczynski, 2006). For example, transformational leaders impact how followers view their jobs by instilling a strong sense of purpose and meaning in their tasks and activities (Bass & Riggio, 2006).

Despite the bounty of research about the effect of transformational leadership on task performance transmitted by the mechanisms of core job characteristics, there remains two limitations. The first limitation is that previous research has focused almost exclusively on the performance benefits of transformational leadership through the mechanisms of core job characteristics (Bacha, 2014; Breevaart et al., 2014; Gumusluoglu & Ilsev, 2009). For example, Piccolo and Colquitt (2006) examined the contribution of core job characteristics in mediating the transformational leadership-task performance relationship and found a positive indirect relationship. The proposition made by Hackman and Oldham's (1976) well-cited paper about core job characteristics encouraging job satisfaction and performance and discouraging turnover

(Parker, 2014) may explain this exclusive focus. However, there may exist the performance costs of transformational leadership through the mechanisms of core job characteristics. Specifically, some perceived core job characteristics impacted by transformational leaders may reflect not only motivational properties but also demanding aspects. In other words, some perceived core job characteristics serve as the mechanisms through which transformational leadership has both positive and negative indirect relationships with follower task performance. This assumption was partially supported by Franke and Felfe (2011) suggesting that transformational leaders provide followers with increased discretion and that this leads, in turn, to their increased responsibility and stress. The second limitation is that little attention has been paid to potential contingency variables for the influence of transformational leadership on followers' perceptions of core job characteristics. To date, there are only a few studies exploring the situational elements in the transformational leadership-core job characteristics relationship (e.g., Dust, Resick, & Mawritz, 2014; Piccolo & Colquitt, 2006). However, it is worthwhile to explore the contingency variables as the fit between leadership style and situation increases the appeal to followers of leaders' actions and values (Trice & Beyer, 1986). In particular, environmental uncertainty appears to be a critical contingency variable that moderates the effectiveness of transformational leadership (e.g., Jansen, Vera, & Crossan, 2009). Linking the suggestions addressing the two proposed limitations, the purpose of the current study, therefore, is to extend previous research on the transformational leadership-task performance relationship. Specifically, the current study suggests that transformational leadership influences follower task performance through the mechanisms of five core job characteristics and two subsequent follower reactions: intrinsic motivation and perceived role overload. The negative paths in the processes are linked by two of the five core job characteristics (i.e., job autonomy and task significance) and subsequent role

overload, while the positive paths are linked by five core job characteristics and subsequent increased intrinsic motivation and reduced role overload. Accordingly, an overall positive, indirect relationship between transformational leadership and task performance is expected as the processes are characterized by more positive than negative indirect links. Furthermore, the current study aims to examine how the influence of transformational leadership on followers' perceptions of core job characteristics is contingent upon levels of environmental uncertainty. To test these propositions, the current study draws on social information processing theory (Salancik & Pfeffer, 1978) and self-determination theory (SDT; Ryan & Deci, 2000a). The theoretical discussions on the hypothesized relationships among these constructs, as shown in Figure 1, are delineated in the following section.

The current research extends Piccolo and Colquitt's (2006) study and thus contributes to the literature on transformational leadership in two ways. First, I dive deeper into the mechanisms of core job dimensions by exploring how the costs of transformational leadership for follower performance go beyond the benefits of it through such mechanisms, allowing researchers to have a more complete understanding of the processes. Although I predict an overall positive indirect relationship between transformational leadership and follower task performance, there is still room for performance improvement. For example, one practical implication of this study is that managers could intervene to buffer the bad consequence of role overload by enhancing the social support to followers. Second, the preceding literature focuses mostly on how environmental uncertainty amplifies followers' responses to transformational leaders in terms of positive behavioral outcomes (e.g., Jansen et al., 2009; Jung, Wu, & Chow, 2008; Waldman, Ramirez, House, & Puranam, 2001). I test whether the amplifying effect applies to followers' perceptions of core job dimensions as responses to transformational leadership. If

my prediction about the amplifying effect of environmental uncertainty is supported, managers working within uncertain environments should place greater importance on developing practices that help followers manage role overload.

CHAPTER 2: THEORY AND HYPOTHESES

In this section, the current study first explains how transformational leadership is linked to five core job characteristics. Then the study elaborates the indirect links of transformational leadership with task performance through five core characteristics and subsequent follower reactions: intrinsic motivation and perceived role overload. Finally, I examine the notion that environmental uncertainty amplifies the relationship between transformational leadership and core job characteristics. Given the amount of work associated with retrieving and coding primary studies for relationships of interests, I decided to locate existing meta-analytic relationships from previous meta-analyses in the first place. Consequently, I note that some of these hypothesized relationships have previously been assessed with meta-analysis. One purpose of the current study is to improve the accuracy of meta-analytic correlations from previous meta-analyses by using them as input of structural equation modeling (SEM), which is consistent with some of prior research (e.g., Lee, Lyubovnikova, Tian, & Knight, 2019). This purpose receives theoretical support from Viswesvaran and Ones's (1995), and Bergh and colleague (2016) suggesting that theory testing is more powerful by applying SEM to estimated meta-analytic correlations. Specifically, this approach offers the ability to control for other variables and thus functions to improve the accuracy of estimated meta-analytic correlations (Bergh et al., 2016). In addition, this approach provides information on the degree of fit for the entire model, thereby allowing model modification and subsequently further improving the accuracy of estimated meta-analytic correlations (Bergh et al., 2016).

Transformational Leadership

Transformational leadership (Bass, 1985; Burns, 1978) has emerged as a particularly effective leadership style by empowering followers to perform beyond basic expectations and

goals (Bass & Avolio, 1994; Conger, Kanungo, & Menon, 2000). Following and inspired by Bass's model of transformational leadership (Bass, 1985; Bass & Riggio, 2006), scholars developed models of charismatic leadership (Conger & Kanungo, 1987; Shamir, House, & Arthur, 1993) that essentially share similarities with Bass's framework (Rowold & Heinitz, 2007). Given the dominant role of Bass's model in charismatic-transformational leadership research, the current study uses the label of transformational leadership and the associated operationalization (i.e., MLQ). Bass's model identifies four behavior components of transformational leadership: exhibiting exemplary behaviors that encourage follower emulation (i.e., idealized influence); communicating clear and appealing visions that instill meaning and purpose to followers' work (i.e., inspirational motivation); coaching and mentoring followers according to their unique needs (i.e., individualized consideration); and encouraging followers to reexamine their assumptions, address old problems from new perspectives, and reformulate problems (i.e., intellectual stimulation) (Bass, Avolio, Jung, & Berson, 2003).

Transformational Leadership and Task Performance

The positive relationship between transformational leadership and follower task performance has been supported by both theoretical rationale and empirical evidence. As a particularly effective leadership style, transformational leadership elicits extra effort from followers (Carless, Wearing, & Mann, 2000). Specifically, transformational leaders have the ability to inspire followers to perform beyond basic expectations by exhibiting leadership behaviors such as conveying the meaningfulness of goals, leading by example, and developing individuals (Bass, 1985; Podsakoff, MacKenzie, Moorman, & Fetter, 1990). Moreover, the effectiveness of transformational leadership on follower task performance has been validated by numerous empirical studies. For example, Wang et al. (2011) found in their meta-analysis that

transformational leadership predicts follower task performance beyond the influence of transactional leadership.

H1: Transformational leadership is positively related to task performance.

Transformational Leaders and Core job characteristics

A leader can positively impact followers' perceptions of job characteristics by making those job characteristics more salient to followers. Social information processing theory (Salancik & Pfeffer, 1978) provides a framework that supports this assumption. Specifically, this theory posits that leaders — a critical source of social information — provide explicit informational cues that influence individuals' interpretations of their jobs (Boekhorst, 2015). In other words, individuals' perceptions of their jobs can derive directly from leaders' behaviors and languages. For example, transformational leaders impact how followers view their jobs by conveying a strong sense of purpose and meaning of their tasks and activities (Bass & Riggio, 2006). Moreover, Piccolo, Greenbaum, Hartog, and Folger (2010) presented a complementary interpretation of social information processing theory. According to Piccolo et al. (2010), leaders can also send implicit informational cues to influence the way followers perceive their work environments. More specifically, in addition to the direct products of leaders' behaviors and languages, followers' perceptions of their jobs can be a byproduct of them. For example, transformational leaders' exhibition of moral behaviors (Bass et al., 2003) may signify to followers the moral consequences associated with leaders' decisions, which influences the way followers view their jobs in terms of the ethical impact. Below, I look at how transformational leadership fosters followers' perception of each of the core job dimensions.

I employ social information processing theory for two reasons. First, this theory allows the examination of both explicit and implicit informational cues sent by leaders that impact

followers' perceptions of their jobs. Second, a large body of research has utilized social information processing theory as a framework to explain how individuals make sense of their work environments (e.g., Arnold, Turner, Barling, Kelloway, & McKee, 2007; Boekhorst, 2015; Wang, Ma, & Zhang, 2014). In the next section, I look at how the described transformational leadership behaviors foster followers' perceptions of five core job characteristics. It should be noted that I do not combine five core job characteristics into a higher order construct when exploring the nuances of the processes.

Job autonomy. Job autonomy is defined as the degree of freedom, independence, and discretion individuals have in scheduling their work activities, making decisions, and deciding the procedures to carry out the work (Morgeson & Humphrey, 2006). Transformational leaders can influence followers' perceptions of job autonomy by engaging in behaviors that signify more follower control over work processes. Specifically, to challenge and empower followers to find better ways of working, transformational leaders create conditions that make followers feel safe and comfortable expressing new ideas in the problem-solving process (Bass et al., 2003; Nemanich & Vera, 2009), facilitating their sense of control over work processes. In addition, followers gain knowledge when finding better ways to complete job tasks. As a consequence of this knowledge, followers have more control over how they complete their work. Moreover, transformational leaders provide job resources that followers need to perform their tasks (Breevaart et al., 2014), helping followers gain a sense of control over work processes.

Skill variety. Skill variety reflects the extent to which individuals need to use various skills or knowledge to carry out their work activities (Morgeson & Humphrey, 2006). Transformational leaders increase followers' sense of skill variety in different ways. First, transformational leaders' effort to promote a better way of working (Bass et al., 2003) may make

followers feel that they need to extend the scope of knowledge to be an innovative person. Moreover, transformational leaders tend to motivate followers to perform beyond basic expectations for the sake of collective interests (Avolio, 1999), which may make followers aware of the necessity of using various skills and knowledge for superior performance. Finally, transformational leaders' effort to develop followers' independence (Dvir, Eden, Avolio, & Shamir, 2002) may encourage followers to develop their skills required to take control over different aspects of work.

Task identity. Task identity reflects the completion of a task from beginning to end (Morgeson & Humphrey, 2006). Transformational leaders share attractive vision and goals among group members, motivating followers to go beyond basic performance expectations (Jung & Sosik, 2002). To have superior performance for the sake of group goals, followers may be encouraged to expand work responsibilities by including upstream and downstream parts of current tasks that contribute to the achievement of group goals, thus increasing task identity. Moreover, transformational leaders provide followers with necessary personal and job resources (Breevaart et al., 2014; Ghadi, Fernando, & Caputi, 2013), increasing followers' ability to expand current work responsibilities. In addition to the actual increase in task identity, followers can increase their perceived task identity as a byproduct of transformational leadership behaviors. Specifically, when followers are aware of the connection of their work to the output of the whole group (i.e., group vision and goals) (Jung & Sosik, 2002), they are likely to have a stronger sense of task completion, thereby increasing task identity.

Task significance. Task significance refers to the impact of an individual's job on the lives or well-being of others inside or outside the organization (Morgeson & Humphrey, 2006). Transformational leaders help followers understand how they contribute to the success of the

group by connecting each individual's work to the achievement of group vision and goals (Jung & Sosik, 2002). Followers' awareness of their contribution to group goods, in turn, makes them realize that they are also benefiting group members and customers whose well-being is influenced by group performance.

Job feedback. Job feedback refers to the degree to which a job delivers direct and clear information about an individual's performance (Morgeson & Humphrey, 2006).

Transformational leaders deliver constructive job feedback to followers as a part of their attention to each individual's growth and achievement. In addition, as discussed above, transformational leaders convey meaningful vision and goals, which function as a part of feedback as followers can adjust their behaviors toward group vision and goals. Moreover, transformational leaders encourage better ways of working and thus support followers' exploratory innovation involving risk taking and experimentation (Jansen et al., 2009). The innovation process, in turn, generates lessons (i.e., feedback) that facilitate followers' learning. According to the aforementioned reasonings, I hypothesize that:

H2: Transformational leadership is positively related to (a) job autonomy, (b) skill variety, (c) task identity, (d) task significance, and (e) job feedback.

Core Job Characteristics, Intrinsic Motivation, and Follower Task Performance

Prior to Ryan and Deci's (2000a) elaboration of intrinsic motivation in self-determination theory (SDT), Hackman and Oldham (1976) introduced the concept of internal motivation in their job characteristics model (JCM). One of the propositions of the JCM is that there are five core job characteristics positively related to internal motivation. However, one limitation of the JCM is that it focuses solely on workers' perceptions of job characteristics as a result of actual

job enrichment interventions (Piccolo et al., 2010), while failing to consider workers' perceptions of job characteristics as a byproduct of leaders' behaviors. Given the limitation of the JCM, I use SDT as the framework explaining the relationships between five core job characteristics and intrinsic motivation. SDT posits that work activities that satisfy three fundamental human psychological needs (i.e., autonomy, competence and relatedness) foster people's intrinsic motivation. The five core job characteristics elicit people's intrinsic motivation in different ways. Specifically, job autonomy (i.e., autonomy in work scheduling, work procedures and work criteria; for a review, see Breugh, 1985) fulfills people's innate psychological need for autonomy. Skill variety is characterized by the breadth of skills and knowledge required by a job (Humphrey, Nahrgang, & Morgeson, 2007) and provides an individual with complex work activities that encourage the development and utilization of different skills or knowledge, leading to a greater feeling of competence. Job feedback also satisfies an individual's need for competence by making the individual realize the appropriate behaviors concerning their tasks. Task identity allows an individual to complete an entire task and subsequently facilitates understanding of the entire work processes, enhancing the feeling of competence. Finally, task significance provides an individual with a sense of relatedness to others because his/her work can improve others' lives or well-being.

Intrinsically motivating activities are characterized by interest and enjoyment due to the rewards embedded in the activity itself such as learning and exploration (Ryan, 2009; Ryan & Deci, 2000a), which in turn encourage individuals to work hard to fully take advantage of the benefits concerning these intrinsic rewards. Notably, intrinsic rewards are distinguishable from the rewards obtained from the internal regulation-related activities such as a sense of self-esteem and the achievement of a life goal, which represent the instrumental value rather than the

enjoyment of the activity (Ryan & Deci, 2000b). Consistent with my argument, Zapata-Phelan and colleagues (2009) argued that what makes intrinsically motivated individuals unique is their high levels of concentration and initiative at work, which are persistent over time since they are driven by the activity itself rather than by external incentives. Indeed, the positive relationship between intrinsic motivation and task performance has been well-established by previous research (for a meta-analytic review, see Cerasoli, Nicklin, & Ford, 2014). Taken together, I hypothesize that:

H3: (a) Job autonomy, (b) skill variety, (c) task identity, (d) task significance, and (e) job feedback are positively related to intrinsic motivation.

H4: Intrinsic motivation is positively related to task performance.

Core Job Characteristics, Perceived Role Overload, and Task Performance

Up until now, the current study has focused on the benefits of transformational leadership for follower performance through the mechanisms of five core job characteristics and subsequent intrinsic motivation. Unfortunately, these mechanisms may be complicated by the costs of transformational leadership for follower performance. It follows that the performance costs of transformational leadership may be shaped by two of the five core job characteristics (i.e., job autonomy and task significance) and subsequent perceived role overload. Although these two core job characteristics are the resources that are supposed to be functional in promoting personal growth or dealing with job demands (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Demerouti & Bakker, 2011), they may also require psychological (cognitive or emotional) and physical effort from employees (Demerouti & Bakker, 2011). Specifically, the two proposed core job characteristics present challenges with respect to an increase in perceived role overload in different ways. Notably, a role at work is a set of expectations from the task, social, physical,

and organizational environments that direct an individual's work behaviors (Morgeson & Humphrey, 2008; Wang, Law, Hackett, Wang, & Chen, 2005). Role overload occurs when employees are expected to fulfill too many duties and responsibilities with limited resources (e.g., time and energy) (Rizzo, House, & Lirtzman, 1970). Before I explain the relationships of job autonomy and task significance with role overload, I should note the distinctions between role overload and its proximal and distal outcomes (i.e., stress, burnout). Work stress is defined as employees' reactions to a work situation that one's abilities are insufficient to cope with the demands at work (AbuAlRub, 2004). Burnout is defined as individuals' responses to chronic exposure to demands at work, which includes three facets (i.e., emotional exhaustion, cynicism, and professional inefficacy) (Maslach, Schaufeli, & Leiter, 2001). In other words, work stress arises from the depletion of resources in response to job demands and leads to burnout over time (Crawford, LePine, & Rich, 2010). According to the definitions of work stress and burnout noted above, role overload as a type of job demand can lead to work stress, and ultimately to burnout.

With respect to the relationship of job autonomy with perceived role overload, I provide two competing perspectives. According to the definition of job resources (Demerouti & Bakker, 2011), some job resources are instrumental in reducing job demands. Not surprisingly, job autonomy allows incumbents to control their jobs by determining the scheduling, sequencing and timing of work activities, and the specific methods utilized to implement the work activities (Breugh, 1985). The opportunities to shape work environments facilitated by job control may reduce individuals' perceptions of role overload as they can decide when and how to perform the work activities. On the other hand, I have reason to believe that there is the cost of job control. Specifically, followers equipped with job control have to carry out additional responsibilities such as solving problems independently and making decisions on their own (Tuckey, Bakker, &

Dollard, 2012), thereby increasing their perceptions of role overload. This competing perspective receives indirect support from Rössler (2012) arguing that physicians suffer from mental illness when their perceived job autonomy reaches a certain level. Taken together, these two competing perspectives suggest that job autonomy maybe positively or negatively related perceived role overload depending on the tradeoff between the associated benefit and the cost.

With respect to the relationship between task significance and perceived role overload, followers who are aware of the impact of their work on the lives or well-being of others may set for themselves higher role expectations to contribute more to others who are influenced by their work. This argument receives indirect support from previous literature. For example, Pearce (2004) suggested that workers are encouraged to share their expertise with and provide feedback to team members when their tasks are highly interdependent. An increase in role expectations increases individuals' perceived role overload. For example, Bolino and Turnley (2005) surveyed alumni of a private university in the United States and demonstrated that employees' fulfillment of roles beyond formally prescribed duties is positively related to role overload.

An increase in perceived role overload, whether from autonomy or task significance, requires individuals to contribute more cognitive and emotional effort (Demerouti & Bakker, 2011) and subsequently reduces their available energy (Maslach & Leiter, 2008), thereby undermining their task performance. The suggestion for energy depletion process caused by increasing demands from the job receives support from previous research. For example, Crawford et al. (2010) found in their meta-analysis that individuals confronted with demands feel gradually exhausted.

I should note that the inclusion of perceived role overload as a mechanism adds three new positive paths from core job characteristics to role overload (i.e., the relationships of skill variety, task identity and job feedback with role overload). As discussed previously, these three core job characteristics increase followers' job competence. The enhanced perceptions of job competence should improve an individuals' ability to deal with many tasks with limited time or energy, thereby reducing perceived role overload. Taken as a whole, the discussion above suggests that:

H5: Job autonomy is (a) positively or (b) negatively related to role overload.

H6: Task significance is positively related to role overload.

H7: (a) Skill variety, (c) task identity, and (c) job feedback are negatively related to role overload.

H8: Role overload is negatively related to task performance.

The Moderating Effect of Environmental Uncertainty

Finally, I discuss the moderating role of environmental uncertainty on the relationships between transformational leadership and core job dimensions. Environmental uncertainty refers to the rate and the unpredictability of environmental change arising from factors such as consumers, suppliers, competitors, and regulatory groups (Dess & Beard, 1984; Govindarajan, 1984). It is noteworthy that an environment characterized by a high level of uncertainty does not imply a crisis (Houghton & Yoho, 2005). More specifically, within an uncertain environment followers are empowered to test their new ideas and respond to environmental demands (Huang, Ding, & Chen, 2014; Özsomer, Calantone, & Di Bonetto, 1997), while in a crisis situation leaders tend to give directive and specific instructions to followers (Houghton & Yoho, 2005). It

should also be noted that environmental uncertainty differs from economic uncertainty conceptually in that economic uncertainty reflects the level of abundance of external resources, while environmental uncertainty refers to the unpredictability of such abundance (Huang, Xu, Chu, Lam, & Farh, 2015).

Since transformational leadership was named in part for its adaptiveness to changing and unpredictable environments (Bass, 1985), there appears to be a natural fit between this type of leadership and environmental uncertainty. Indeed, the natural fit between these two constructs has been well documented in previous research (e.g., Ensley, Pearce, & Hmieleski, 2006). However, there is still a lack of understanding about how this natural fit impacts followers' perceptions of their jobs. In order to address this gap, social information processing theory was utilized to suggest that transformational leaders send informational cues to followers through the interpretation of uncertain environments and ultimately influence their perceptions of jobs. Specifically, since transformational leaders tend to act for the sake of collective benefits (Cho & Dansereau, 2010), they should emphasize the threats to firm survival when faced with uncertain environments. Followers' awareness of firm survival threats caused by uncertain environments makes transformational leaders' behaviors more salient to them and subsequently amplifies their perceptions of jobs.

Specifically, within the uncertain environment followers should be more receptive to transformational leaders' encouragement of better ways of working as this facilitates creativity and subsequently benefits firm survival within such an environment. Together with the previous argument regarding follower reactions to transformational leaders' encouragement of better ways of working in terms of their perceived job autonomy, skill variety and job feedback, I suggest that the uncertain environment amplifies the relationships of transformational leadership with job

autonomy, skill variety and job feedback. Second, within the uncertain environment followers should be more responsive to transformational leaders' vision for the group as it directs the way followers can follow to cope with environmental uncertainty. Combined with the previous argument regarding the link between transformational leaders' vision and task identity, I predict that the uncertain environment amplifies the relationship between transformational leadership and task identity. Finally, within the uncertain environment followers should more strongly identify with transformational leaders' belief that each individual's tasks significantly contribute to the collective interests, as an individual's work matters to firm survival within such an environment. Given the previous argument that transformational leaders' emphasis on followers' contributions to group goods increases task significance, I predict that environmental uncertainty amplifies the effect of transformational leadership on task significance.

It should be noted that, instead of examining the interaction effect of environmental uncertainty and transformational leadership on each of the core job dimensions, I combine the five core job dimensions into a higher order construct (i.e., core job characteristics) when exploring the interaction effect. The use of a single job characteristics construct is consistent with some prior analysis (e.g., Demerouti, 2006; Piccolo & Colquitt, 2006), and was a statistical necessity in this particular case (as explained in the Method section). Previous research justified the unidimensional model of core job dimensions in terms of the motivational foundation and a high degree of internal consistency reliability of these five core job dimensions (e.g., Houkes, Janssen, de Jonge, & Bakker, 2003; Purvanova & Bono, 2006).

H9: Environmental uncertainty moderates the relationship between transformational leadership and core job characteristics such that the relationship between them is stronger when the organization's environment is perceived as uncertain.

CHAPTER 3: METHOD

There were four steps conducted to test the hypothesized model (see Figure 1). First, I conducted a systematic electronic search to retrieve existing meta-analytic estimates for bivariate relationships between all pairs of variables of interest listed in Table 1. As a result of this search, I found meta-analytic estimates from previous meta-analyses for the relationship of transformational leadership with task performance, relationships among core job dimensions, relationships of core job dimensions with intrinsic motivation and role overload, relationships of core job dimensions with task performance, and relationships of intrinsic motivation and role overload with task performance (see Table 2 for details). Second, a new electronic search was conducted to retrieve studies for the remaining bivariate relationships. Specifically, I conducted new meta-analyses in the present study for the relationships of transformational leadership with five core job dimensions, intrinsic motivation and role overload, and relationships of role overload with skill variety, task identity, job feedback, and intrinsic motivation (see Table 3 for details). Third, I created a meta-analytic correlation matrix based on the estimates from previous meta-analyses and from the present study, and then conducted structural equation modeling (SEM) to test the hypothesized main effects using the meta-analytic correlation matrix as input. Finally, I utilized the subgroup comparison method (Hunter & Schmidt, 2004) to examine the hypothesized moderating effect.

Applying MASEM to relationships tested with traditional meta-analysis may yield both more accurate and nuanced findings. This is because MASEM offers several advantages beyond traditional meta-analysis, such as providing information on the degree of fit for the entire model and offering the ability to control for other variables (Bergh et al., 2016).

Literature search

Databases utilized to conduct the electronic search included Dissertations & Theses Global (ProQuest), EBSCOhost, ProQuest, and Google Scholar up to and including the year of 2019. Multiple electronic databases were selected on EBSCOhost, including Academic Search Complete, Business Source Complete, MEDLINE, PsycEXTRA, Psychology and Behavioral Sciences Collection, SocINDEX with Full Text, and Business Abstracts with Full Text (H.W. Wilson). In addition, a manual search was conducted to identify additional relevant studies by examining the reference lists of recent work design meta-analyses (e.g., Luchman & González-Morales, 2013; Nahrgang, Morgeson, & Hofmann, 2011).

To identify existing meta-analytic estimates to be included in the meta-analytic correlation matrix, a search for previous meta-analyses was conducted in the databases mentioned above. The electronic search contained the combination of the meta-analysis-relevant terms (i.e., meta-analysis, meta-analytic review, quantitative review) and relevant keywords, including transformational leadership, job characteristics (i.e., autonomy, job control, decision discretion, skill variety, task identity, task significance, and job feedback), intrinsic motivation, internal motivation, overload, workload, and performance. If the search identified more than one existing meta-analysis for a given relationship, the estimate based on the largest number of primary studies was kept (Zimmerman, 2008). For relationships that were not included in existing meta-analyses, a new search was conducted in the same databases where the existing meta-analyses were identified using the same keywords. Studies located from the new search were used to estimate the remaining meta-analytic correlations.

Inclusion criteria

To be retained in the new meta-analyses reported here, studies identified had to meet four criteria. First, the study must report the sample size and contain the bivariate correlation between variables of interest or statistical information (means, standard deviations, t statistics, or F statistics) to compute the bivariate correlation. Second, the study had to employ working adults (i.e., over the age of 18), not children or students who were instructed to take over manipulated roles. Third, the study must report the individual-level relationship between variables of interest. Finally, each study must have a unique sample to avoid the double inclusion of a data set for a given relationship. If a data set for a given relationship was used in more than one study, this data set in all subsequent studies was excluded from the meta-analysis. Using these inclusion criteria, 62 relevant published studies and unpublished dissertations with 72 independent samples were identified in the additional search and included in the meta-analysis.

Coding procedure

Prior to coding, a coding rubric was developed containing the general description of the variables of interest in the current study and the specific items measuring these variables from the most frequently employed measurement instruments (Montano, Reeske, Franke, & Hüffmeier, 2017). All studies were coded by two independent raters. Agreement between the two coders was 96%, and any disagreement was resolved through discussion. Studies identified in the new search were coded in terms of the measure of each variable of interest, the effect size, the sample size, the reliability, and the moderator variable. It should be noted that the coding of environmental uncertainty only applies to the studies containing the relationships between transformational leadership and core job dimensions.

Transformational leadership. I focused on the general form of transformational leadership, which was included as either the general form or the specific dimensions of transformational leadership. Operationalizations of transformational leadership using formats different from those in Bass's model (e.g., Podsakoff et al., 1990) were included in the meta-analysis if they captured all four dimensions in Bass's model (i.e., idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration).

Job characteristics. The measure of job autonomy included autonomy, job control, and decision latitude. In particular, job control and decision latitude were used as synonyms of job autonomy. The remaining core job dimensions (i.e., skill variety, task identity, task significance, and job feedback) were coded according to their variable names.

Intrinsic motivation. The measure of intrinsic motivation included both intrinsic motivation and internal motivation as the concept of internal motivation (Hackman and Oldham, 1976) is similar to intrinsic motivation introduced by Deci (1975) (Piccolo et al., 2010).

Role overload. The measure of role overload included both role overload and workload (or work overload). In particular, workload has been used as a synonym of role overload (Örtqvist & Wincent, 2006). I focused on the general form of role overload, which was included as either the general form or the specific facets (e.g., qualitative facet, quantitative facet) of role overload.

Task performance. I focused on the general form of task performance, which was included as either a broad construct or the specific sources of task performance (e.g., self-report performance, supervisor rated performance) and/or facets (e.g., quality, quantity) of performance.

Environmental uncertainty. To conduct the moderator analysis, studies examining the relationships between transformational leadership and core job dimensions were coded in terms of the industry the sample was drawn from. Industries were coded as high or low uncertainty, based on the descriptions in Carmeli, Schaubroeck, and Tishler (2011). I calculated interrater agreement on this specific component, in addition to examining it across all coded information, because the level of environmental uncertainty was not explicitly stated within primary studies but inferred by the coders. Interrater agreement was 91%, and any disagreement was resolved through discussion. For studies concerning the relationships between transformational leadership and core job dimensions, they were excluded from the moderator analysis if the industry the sample was drawn from was not specified.

Analytic approach

In the new meta-analyses conducted here, I used Hunter and Schmidt's (2004) method of meta-analysis to estimate true correlations among variables of interest at the individual level. The method corrects each correlation for sampling and certain measurement errors (i.e., random error, item-specific error; Le, Schmidt, & Putka, 2009). This is done by gathering the sample size and the internal consistency reliability coefficient (Cronbach's alpha) for each analysis. For included studies that did not report the Cronbach's alpha, I followed common practice (e.g., Humphrey et al., 2007) and substituted the average value of Cronbach's alpha estimated from the other identified studies. Composite correlations (Hunter & Schmidt, 2004) were computed when identified studies did not report the general form of the variable of interest, but instead reported multiple facets or scales of the variable of interest and provided the inter-correlations between them (Humphrey et al., 2007). When the relevant inter-correlations were not reported, the average effect size was computed (Bergh et al., 2016).

The hypothesized model was tested using meta-analytic structural equation modelling (MASEM), which combines the benefits of meta-analysis and structural equation modelling. In particular, compared to traditional bivariate meta-analysis, MASEM takes into account the interplay between variables and thus provides deeper insight into the relationships of interest. To conduct MASEM, I used the software Mplus 7.0 (Muthén & Muthén, 2012). MASEM requires that each cell in the meta-analytic correlation matrix have the same sample size. Following Viswesvaran and Ones's (1995) recommendation, I used the harmonic mean sample size to keep the sample size in each cell constant, which is a common practice to compute the least biased standard errors of regression coefficients (Brown et al., 2008). The test of the moderating effect of environmental uncertainty was conducted through subgroup comparisons (Hunter & Schmidt, 2004) rather than the SEM multi-group comparison approach. This was done because some of the population estimates in the meta-analytic matrix derived from previous meta-analyses, which did not divide the studies into two different levels of environmental uncertainty. Moreover, in some cases, there was only one study available which reported the relationship between transformational leadership and a particular core job dimension and which could reliably be coded for certain or uncertain environment. As a result, I combined five core job dimensions into a higher order construct (i.e., core job characteristics) to conduct the moderator analysis.

CHAPTER 4: RESULTS

Main Effects

Following a two-step MASEM procedure, I first created a meta-analytic correlation matrix containing the population estimates of bivariate correlations between all pairs of variables in the hypothesized model. Table 1 presents the meta-analytic matrix, which combined correlations obtained from previous meta-analyses (see Table 2) and from the meta-analyses conducted in the current study (see Tables 3 and 4). Before I conducted MASEM, the model was specified containing the paths from transformational leadership to task performance through five core job dimensions, intrinsic motivation, and role overload. Additionally, I allowed the residuals of five core job dimensions, and the residuals of intrinsic motivation and role overload to covary. Overall, the hypothesized model indicated good fit with the data ($\chi^2(7) = 771.57$, RMSEA = .15, SRMR = .03, CFI = .95), but it should be noted that the RMSEA was greater than the cut-off value of .08 (Kenny, Kaniskan, & McCoach, 2014). As such, the hypothesized model was compared with two theoretically plausible alternative models using the chi-square difference test. The first alternative model reflected partial, rather than full, mediation in the relationships of transformational leadership with intrinsic motivation and role overload (see Figure 2a). This alternative model had an overall good fit to the data ($\chi^2(5) = 637.38$, RMSEA = .16, SRMR = .02, CFI = .96) and exhibited a significantly better fit than the original hypothesized model ($\Delta\chi^2(2) = 134.19$, $p < .001$). However, the RMSEA was still above the cut-off value of .08. I proceeded to test a second alternative model (see Figure 2b). This model reflected only partial mediation in the relationships of five core job dimensions with task performance. This alternative model had an adequate fit to the data in terms of all fit indexes except for the RMSEA ($\chi^2(2) = 134.20$, RMSEA = .12, SRMR = .02, CFI = .99) and a significantly better model fit than the original

hypothesized model ($\Delta\chi^2(5) = 637.37, p < .001$). Although the RMSEA for the second alternative model was still above the cut-off value of .08, this alternative model was adopted since RMSEA is known to sometimes yield a misleading measure of fit when the degrees of freedom are small (Kenny et al., 2014). The path from task identity to intrinsic motivation was not significant and therefore was removed from the second alternative model, resulting in the final model utilized to test the hypothesized main effects. The final model fit the data well ($\chi^2(3) = 135.91, RMSEA = .10, SRMR = .02, CFI = .99$). As discussed above, the value of RMSEA did not prevent me from accepting the final model due to the small degrees of freedom.

As shown in Table 5, all of the hypothesized main effects were supported except for the association between task identity and intrinsic motivation (Hypothesis 3c). I predicted that transformational leadership would be positively related to task performance (Hypothesis 1) and five core job characteristics (Hypotheses 2a-2e). Table 5 showed that these hypotheses were supported not only for task performance ($\beta = .15, p < .001$), but also for job autonomy ($\beta = .40, p < .001$), skill variety ($\beta = .33, p < .001$), task identity ($\beta = .30, p < .001$), task significance ($\beta = .22, p < .001$), and job feedback ($\beta = .43, p < .001$). Table 5 also showed that job autonomy ($\beta = .09, p < .001$), skill variety ($\beta = .14, p < .001$), task significance ($\beta = .22, p < .001$), and job feedback ($\beta = .18, p < .001$) were positively related to intrinsic motivation (Hypotheses 3a, 3b, 3d, and 3e). Thus, hypotheses 3a-3e except for 3c received support. Intrinsic motivation was subsequently positively related to task performance ($\beta = .13, p < .001$), supporting Hypothesis 4. Hypotheses concerning the positive relationships between core job characteristics and role overload (Hypotheses 5a and 5b, and 6) were supported for job autonomy ($\beta = .14, p < .001$) and task significance ($\beta = .76, p < .001$), and hypotheses concerning the negative relationships between core job dimensions and role overload (Hypotheses 7a, 7b, and 7c) were supported for

skill variety ($\beta = -.14, p < .001$), task identity ($\beta = -.38, p < .001$) and job feedback ($\beta = -.38, p < .001$). Role overload was subsequently negatively related to task performance ($\beta = -.23, p < .001$), supporting Hypothesis 8.

Moderator analysis

As shown in Table 6, the percentage of variance accounted for by artifacts was below 75% for the meta-analytic estimate of the transformational leadership-core job characteristics relationship, suggesting the presence of moderator (Hunter, Schmidt, & Jackson, 1982). I predicted that transformational leadership would have a stronger relationship with perceived core job characteristics when the environment is perceived as uncertain (Hypothesis 9). As shown in Table 6, subgroup analyses by the level of environmental uncertainty supported H8 ($z = -11.47, p < .001$). Moreover, the 95% CIs for the relationship of transformational leadership with core job characteristics did not overlap between two different levels of environmental uncertainty in conditions of low ($\rho = .25, 95\% \text{ CI } [.14, .35]$) and high uncertainty ($\rho = .46, 95\% \text{ CI } [.37, .54]$), further suggesting moderation.

I also examined whether the meta-analytic correlations between task performance and its hypothesized antecedents were significantly different between published and unpublished studies to assess the possibility of publication bias (i.e., significant effect sizes are more likely to be published) which may result in an overestimation of meta-analytic effect sizes (Eatough, Chang, Miloslavic, & Johnson, 2011). Testing for publication bias was conducted by previous meta-analyses listed in Table 2. As shown in Table 7, in terms of the transformational leadership-task performance relationship, the substantial overlap between the 95% confidence intervals for published ($\rho = .21, 95\% \text{ CI } [.16, .26]$) and unpublished ($\rho = .21, 95\% \text{ CI } [.04, .37]$) studies indicated that publication status did not moderate this relationship. In contrast, with respect to the

role overload-task performance relationship, the 95% confidence intervals for published ($r = -.08$, 95% CI $[-.11, -.06]$) and unpublished ($r = -.02$, 95% CI $[-.06, .02]$) studies slightly overlapped. Non-overlapping confidence intervals were greater than the criterion of 84% (Julious, 2004), suggesting that publication status moderated the role overload-task performance relationship. Finally, file drawer analysis demonstrated that for the relationship between intrinsic motivation and task performance, 586 unpublished studies were needed to reduce the meta-analytic estimate to non-significance. Thus, a substantial number of required unpublished studies did not suggest the presence of publication bias for the intrinsic motivation-task performance relationship.

CHAPTER 5: DISCUSSION

The current study sheds new light on the way transformational leadership impacts follower task performance, by highlighting the mechanisms of core job dimensions and two follower reactions (i.e., intrinsic motivation and perceived role overload). Specifically, I found three simultaneous effects comprising the relationship. First, transformational leadership was positively related to the five core job dimensions, and subsequently to intrinsic motivation, which in turn increased task performance. Second, transformational leadership also contributed to increased role overload through job autonomy and task significance, and that greater role overload reduced task performance. Finally, transformational leadership's effect on the other three core job dimensions (skill variety, task identity, and job feedback) simultaneously contributed to less role overload, and thus increased task performance.

The results are consistent with previous research focused on the role of core job dimensions in shaping the benefits of transformational leadership (e.g., Astrauskaite, Notelaers, Medisauskaite, & Kern, 2015). However, to my knowledge, this study provides the first examination of the potential downside of transformational leadership through the demanding aspects of enriched jobs. I found that two core job dimensions shaped the performance cost of transformational leadership by increasing perceived role overload, suggesting that the overall positive relationship between transformational leadership and follower task performance conceals unintended detrimental effects in the processes. In other words, underlying the net positive effect of transformational leadership on task performance is a mix of positive and negative effects. This finding is consistent with Meindl, Ehrlich, and Dukerich's (1985) argument that positive perceptions of leadership do not exclude the possibility of negative outcomes arising from leaders' good intentions.

In addition to suggesting the existence of mixed relationships, the three simultaneous effects underlying the transformational leadership-task performance relationship add to our understanding of core job dimensions. First, although I found that job autonomy, skill variety, task significance, and job feedback were positively related to intrinsic motivation, the relationship of task identity with intrinsic motivation was found to be insignificant. This insignificant relationship is inconsistent with previous research emphasizing the motivational value of core job dimensions. One possible reason for this insignificant relationship is that the completion of an entire task may not always promote an individual's job competence that functions to increase intrinsic motivation. More specifically, jobs characterized by traits such as repetitive and boring, as opposed to challenging, may not yield a sense of competence for job incumbents, suggesting that the motivational value of particular job characteristics functions only in specific situations. Second, the findings help scholars gain insight into core job dimensions in terms of their mixed effects. I found that some of the core job dimensions (i.e., skill variety, task identity, and job feedback) were exclusively instrumental by increasing intrinsic motivation and/or decreasing role overload. Some of them (i.e., job autonomy, task significance), however, exhibited both instrumental and detrimental effects by increasing intrinsic motivation and role overload simultaneously. The finding regarding the mixed effects of particular core job dimensions suggests that certain job characteristics featuring intrinsic motivation (for a list of motivational job characteristics, see Humphrey et al., 2007) satisfy innate people's psychological needs (i.e., autonomy, competence, relatedness) by requiring personal effort. For example, job complexity satisfies the psychological need of job competence as complex jobs encourage employees to develop and utilize their skills. Meanwhile, job complexity is likely to increase mental workload (Humphrey et al., 2007).

The three simultaneous effects mentioned above begin with the relationships of transformational leadership with five core job characteristics. Although previous research provides evidence that transformational leadership is positively related to core job dimensions, I am aware of no studies examining the differential effects between them. Failure to explore such differential effects impedes our understanding of the nuances of transformational leadership processes. I found that, in addition to the positive relationship between transformational leadership and five core job characteristics, job autonomy and feedback were the two core job dimensions strongly predicted by transformational leadership. This finding suggests that a part of transformational leaders' focus is to develop follower independence and self-efficacy (Dvir et al., 2002), in addition to conveying inspirational vision and goals.

Finally, the results confirmed the amplifying effect of environmental uncertainty on the relationship between transformational leadership and core job characteristics. This finding suggests that transformational leaders could further increase their influence on followers' perceptions of their jobs within uncertain environments by manipulating their language in terms of environmental threats to firm survival. This suggestion is consistent with Jung et al.'s (2008) argument that although managers are not able to modify external environmental factors, they could leverage these factors for the sake of the organization. In particular, transformational leaders could leverage environmental uncertainty through their language and consequently reap more benefits associated with the stronger influence on core job dimensions, by increasing intrinsic motivation and/or reducing role overload. In addition, this amplifying effect further supports the natural fit between transformational leadership and uncertain environments by extending the outcomes of this amplifying effect from positive work behaviors to perceptions of core job characteristics.

Practical Implications

The findings also offer practical implications for organizations seeking to promote transformational leadership. As evidenced by the results, transformational leadership posed a challenge to followers by increasing their perceived role overload through increased job autonomy and task significance, and that increased role overload subsequently undermined their task performance. However, the existence of the detrimental effect of transformational leadership for follower task performance does not mean that organizations should abandon the idea of developing this type of leadership. Instead, leaders should be cautious when implementing transformational leadership. Specially, in addition to displaying transformational leadership behaviors to reap the associated motivational benefits arising from core job dimensions, an effective leader should also integrate role overload-coping activities into management practices aiming to help followers reduce their stress.

The suggested role overload-coping activities are particularly important within an uncertain environment as the amplifying effect of environmental uncertainty implies that followers have stronger perceptions of job autonomy and task significance within this environment, which are the two core job characteristics the findings demonstrated may increase perceived role overload.

Limitations and Directions for Future Research

It should be noted that there are several potential limitations of the current study. First, there are limitations in terms of the nature of the ~~results~~ study design. Specifically, there were a limited amount of primary studies for the relationship between transformational leadership and each of the core job dimensions under two different levels of environmental uncertainty.

Consequently, to test the moderating effect, I combined five core job characteristic into a higher

order construct, thereby making it impossible to explore whether environmental uncertainty has differential amplifying effects on the relationships between transformational leadership and five distinct core job dimensions. The exploration of the differential amplifying effects of environmental uncertainty is particularly crucial to the relationships of transformational leadership with job autonomy and task significance, because these two core job characteristics were found to increase role overload. Future research could examine these differential amplifying effects to address this limitation. In addition, this study used existing meta-analytic estimates from previous meta-analyses for particular relationships of interests given the amount of work in terms of locating and coding primary studies. I am aware of this limitation that if all of the estimates are calculated in the present study through meta-analysis, more robust findings would be achieved. Moreover, the moderator analysis by publication status suggested that the population estimate for the role overload-task performance relationship may be somewhat inflated. Thus, the results should be interpreted with caution. In addition, the cross-sectional nature of the majority of studies limited the ability to make causal inference among variables of interest. Finally, since the meta-analysis was based on the between-individual approach, there is still a lack of understanding about how the daily fluctuations in employees' perceptions of their leaders influence their task performance through the proposed mechanisms. To understand the dynamic nature of the hypothesized relationships, future research could extend the current study by employing the within-individual approach to examine the differences in the magnitude of relationships. As suggested by Christian, Gaza, and Slaughter (2011), the within-individual approach may generate stronger momentary relationships than the between-individual approach.

I also suggest some additional paths for future research. First, more research is needed to uncover potential contingency variables that alter the relationships between transformational

leadership and core job dimensions. For example, employees with a high need for achievement may be more likely to accept and consequently be more sensitive to job control, thereby strengthening the relationship between transformational leadership and job autonomy. Second, in addition to the five core job dimensions, future research could explore the nuances of other potential motivational job characteristics that may function to shape the costs of transformational leadership.

CONCLUSION

There is substantial evidence indicating that transformational leadership is an effective leadership style that promotes follower task performance. The current study suggests that the optimization of transformational leadership effectiveness is possible by considering the performance benefits and costs of this type of leadership through the mechanisms of core job mechanisms and subsequent follower reactions. The results highlight the importance of addressing management practices related to role overload, such as through leadership training programs, particularly for organizations operating within an uncertain environment.

TABLES AND FIGURES

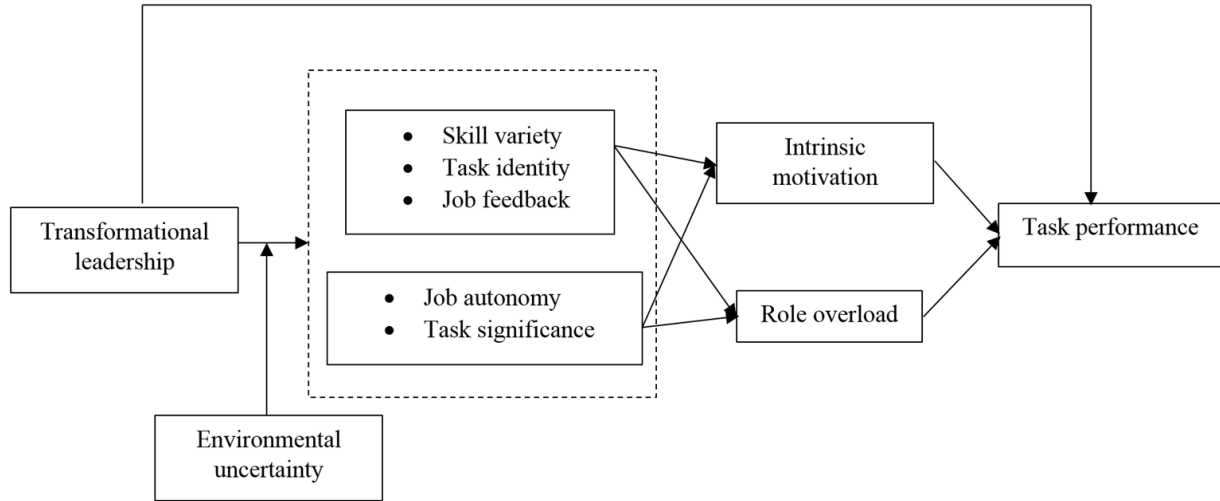


Figure 1. Summary of hypotheses

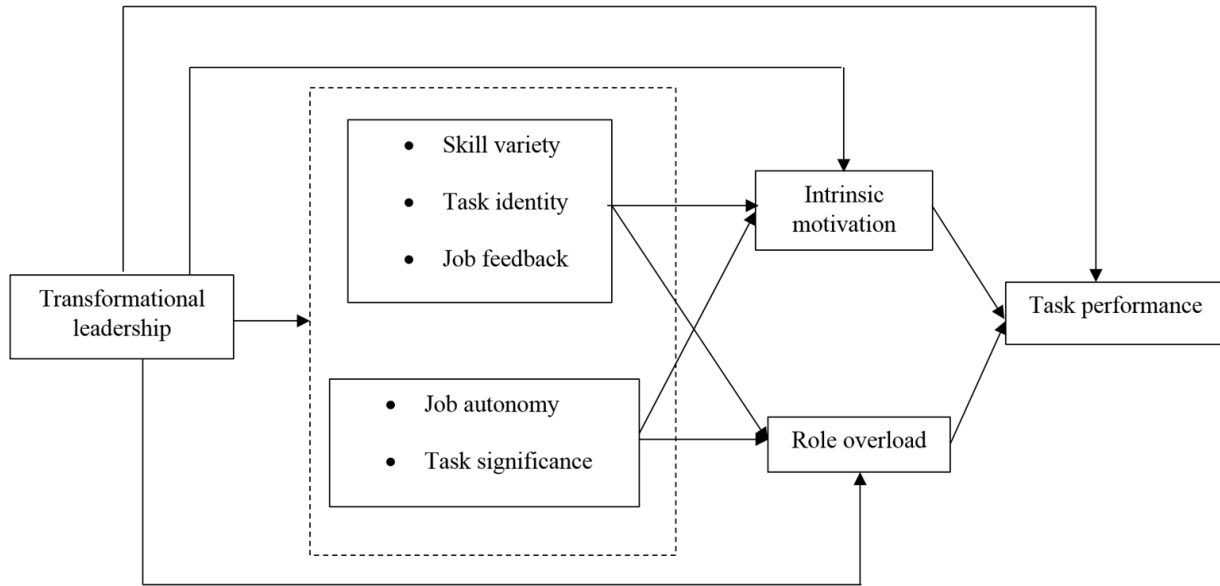


Figure 2(a). Alternative path model 1 used to test the hypothesized main effects

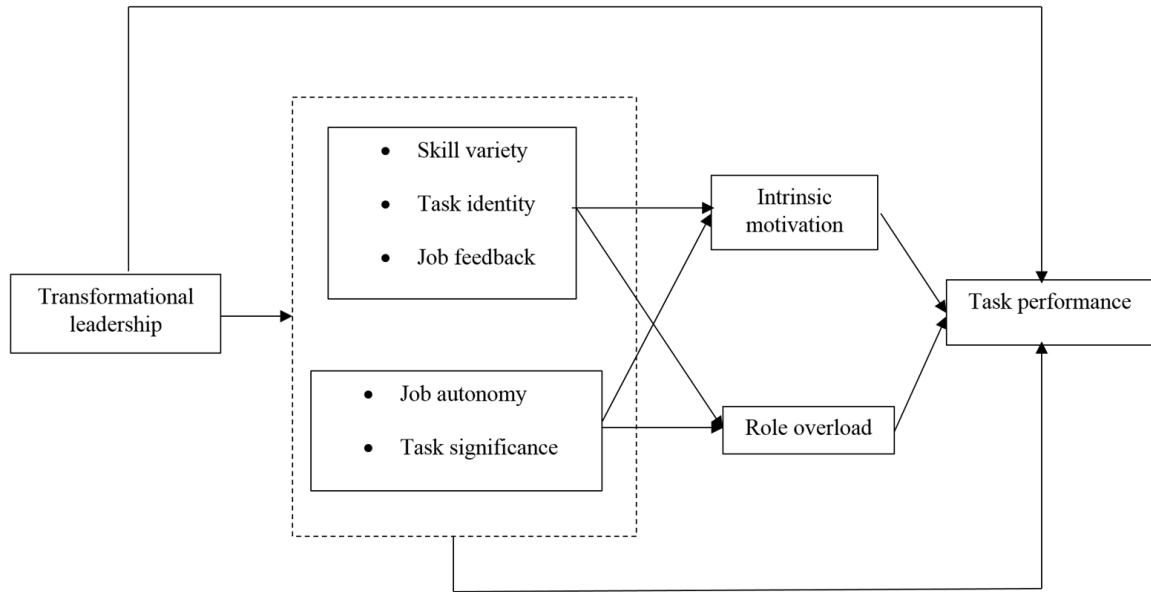


Figure 2(b). Alternative path model 2 used to test the hypothesized main effects

Table 1. Meta-analytic correlations among study variables

Variable	Transformational leadership	Job autonomy	Skill variety	Task identity	Task significance	Job feedback	Intrinsic motivation	Role overload
1. Transformational leadership	–							
2. Job autonomy	.40	–						
(<i>k</i> , <i>N</i>)	(29, 13,096)							
(95% CI)	(.31, .48)							
3. Skill variety	.33	.64 ^b	–					
(<i>k</i> , <i>N</i>)	(6, 2,492)	(100, 58,350)						
(95% CI)	(.15, .51)	(.60, .69)						
4. Task identity	.30	.55 ^b	.37 ^b	–				
(<i>k</i> , <i>N</i>)	(6, 1,893)	(111, 43,427)	(80, 36,334)					
(95% CI)	(.16, .44)	(.51, .59)	(.32, .41)					
5. Task significance	.22	.50 ^b	.62 ^b	.39 ^b	–			
(<i>k</i> , <i>N</i>)	(5, 1,573)	(100, 41,837)	(78, 37,758)	(83, 37,435)				
(95% CI)	(.04, .40)	(.46, .54)	(.58, .66)	(.34, .43)				
6. Job feedback	.43	.53 ^b	.50 ^b	.49 ^b	.56 ^b	–		
(<i>k</i> , <i>N</i>)	(8, 3,115)	(110, 44,390)	(79, 36,256)	(92, 41,108)	(80, 37,082)			
(95% CI)	(.30, .56)	(.49, .56)	(.46, .55)	(.45, .54)	(.51, .61)			
7. Intrinsic motivation	.30	.38 ^b	.42 ^b	.26 ^b	.45 ^b	.42 ^b	–	
(<i>k</i> , <i>N</i>)	(17, 6,800)	(48, 20,835)	(47, 19,098)	(44, 19,013)	(41, 18,362)	(44, 19,013)		
(95% CI)	(.24, .37)	(.35, .42)	(.39, .46)	(.23, .28)	(.41, .50)	(.39, .46)		
8. Role overload	-.19	.02 ^b	.09	-.24	.38 ^b	-.14	-.13	–
(<i>k</i> , <i>N</i>)	(7, 2,732)	(7, 2,961)	(8, 1,814)	(7, 2,788)	(3, 587)	(8, 15,064)	(5, 1,868)	
(95% CI)	(-.29, -.10)	(-.11, .14)	(-.19, .37)	(-.47, -.01)	(.29, .47)	(-.22, -.06)	(-.27, .01)	
9. Task performance	.21 ^a	.20 ^{b,e}	.02 ^{b,e}	.12 ^{b,e}	.23 ^{b,f}	.15 ^{b,e}	.26 ^c	-.08 ^d
(<i>k</i> , <i>N</i>)	(31, 7,016)	(51, 9,071)	(29, 5,718)	(32, 8,815)	(20, 3,503)	(34, 6,115)	(183, 212,468)	(40, 8,298)
(95% CI)	(.16, .26)	– ^g	– ^g	– ^g	(.16, .29)	– ^g	– ^h	(-.10, .01)

Note. All meta-analytic correlations in the cells were sample-size weighted correlations corrected for unreliability; Unless noted, meta-analytic correlations in the cells were calculated by the present study; *k* = number of independent samples; *N* = number of subjects; 95% CI = 95% confidence interval around the true correlation (ρ); ^a Meta-analytic correlation from Wang et al. (2011); ^b Meta-analytic correlation from Humphrey et al. (2007); ^c Meta-analytic correlation from Cerasoli et al. (2014); ^d Meta-analytic correlation from Gilboa et al. (2008); ^e Average meta-analytic correlation across objective and subjective performance in Humphrey et al.'s (2007) study; ^f Meta-analytic correlation between task significance and subjective performance. Humphrey et al. (2007) did not report the meta-analytic correlation between task significance and objective performance; ^g Confidence interval for the meta-analytic correlation between each of the core job dimensions and overall task performance was not reported in Humphrey et al.'s (2007) study; ^h Confidence interval for the meta-analytic correlation between intrinsic motivation and task performance was not reported in Cerasoli et al.'s (2014) study.

Table 2. Meta-analytic correlations among study variables obtained from previous meta-analyses

Study	<i>k</i>	<i>N</i>	ρ	Relationship	Performance measure
Wang et al. (2011)	31	7,016	.21	Transformational leadership with task performance	Task performance
Humphrey et al. (2007)	Meta-analytic correlations among core job dimensions				NA
	100	58,350	.64	Job autonomy with skill variety	
	111	43,427	.55	Job autonomy with task identity	
	100	41,837	.50	Job autonomy with task significance	
	110	44,390	.53	Job autonomy with job feedback	
	80	36,334	.37	Skill variety with task identity	
	78	37,758	.62	Skill variety with task significance	
	79	36,256	.50	Skill variety with job feedback	
	83	37,435	.39	Task identity with task significance	
	92	41,108	.49	Task identity with job feedback	
	80	37,082	.56	Task significance with job feedback	
Humphrey et al. (2007)	Meta-analytic correlations of core job dimensions with internal work motivation				NA
	48	20,835	.38	Job autonomy with internal work motivation	
	47	19,098	.42	Skill variety with internal work motivation	
	44	19,013	.26	Task identity with internal work motivation	
	41	18,362	.45	Task significance with internal work motivation	
	44	19,013	.42	Job feedback with internal work motivation	
Humphrey et al. (2007)	Meta-analytic correlations of core job dimensions with overload ^a				NA
	7	2,961	.02	Job autonomy with overload	
	3	587	.38	Task significance with overload	

Continued

Table 2. (Continued)

Study	<i>k</i>	<i>N</i>	ρ	Relationship	Performance measure
Humphrey et al. (2007)	Meta-analytic correlations of core job dimensions with performance ^b				Objective and subjective performance
	51	9,071	.20 ^c	Job autonomy with performance	
	29	5,718	.02 ^c	Skill variety with performance	
	32	8,815	.12 ^c	Task identity with performance	
	20	3,503	.23 ^d	Task significance with performance	
34	6,115	.15 ^c	Job feedback with performance		
Cerasoli, Nicklin, and Ford (2014)	183	212,468	.26 ^e	Intrinsic motivation with overall performance	Overall performance (i.e., qualitative and quantitative performance and productivity)
Gilboa, Shirom, Fried, and Cooper (2008)	40	8,298	-.08	Role overload with general performance	General performance (i.e., qualitative and quantitative performance)

Note. *k* = number of independent samples; *N* = number of subjects; ρ = sample-size weighted mean correlation corrected for unreliability; NA= not applicable.

^a I contacted Stephen E. Humphrey for the clarification of the operationalization of overload in Humphrey et al.'s (2007) study. In their study, overload was coded broadly as role overload and work overload (i.e., workload).

^b I contacted Stephen E. Humphrey for the clarification of the operationalization of performance in Humphrey et al.'s (2007) study. In their study, the constructs of extra-role and creative performance were excluded from the operationalization of performance.

^c Average meta-analytic correlation across objective and subjective performance.

^d Meta-analytic correlation between task significance and subjective performance. Humphrey et al. (2007) did not report the meta-analytic correlation between task significance and objective performance.

^e In Cerasoli and Nicklin's (2009) study, autonomous motivation (i.e., a combination of intrinsic and identified motivation) was included as a category of the operationalization of intrinsic motivation. The inclusion of autonomous motivation was validated by them as there was no significant difference between the categories of autonomous and intrinsic motivation.

Table 3. Meta-analytic correlations not included by previous meta-analyses

Bivariate relationship	<i>k</i>	<i>N</i>	<i>r</i>	ρ	<i>SDρ</i>	80% CV	95% CI	% Var.
Transformational leadership								
Job autonomy	29	13,096	.35	.40	.22	(.11, .68)	(.31, .48)	4.44
Skill variety	6	2,492	.28	.33	.22	(.04, .62)	(.15, .51)	5.59
Task identity	6	1,893	.25	.30	.16	(.09, .51)	(.16, .44)	13.28
Task significance	5	1,573	.18	.22	.19	(-.03, .46)	(.04, .40)	10.76
Job feedback	8	3,115	.37	.43	.18	(.20, .66)	(.30, .56)	7.55
Intrinsic motivation	17	6,800	.27	.30	.13	(.14, .47)	(.24, .37)	13.99
Role overload	7	2,732	-.17	-.19	.12	(-.35, -.04)	(-.29, -.10)	17.45
Role overload								
Skill variety	8	1,814	.07	.09	.41	(-.41, .59)	(-.19, .37)	4.05
Task identity	7	2,788	-.15	-.24	.30	(-.62, .15)	(-.47, -.01)	5.45
Job feedback	8	15,064	-.12	-.14	.11	(-.28, .01)	(-.22, -.06)	5.52
Intrinsic motivation	5	1,868	-.11	-.13	.15	(-.32, .05)	(-.27, .01)	14.88

Note. *k* = number of independent samples; *N* = number of subjects; *r* = sample-size weighted mean uncorrected correlation; ρ = sample-size weighted mean correlation corrected for unreliability; *SD ρ* = standard deviation of the true correlation (ρ); 80% CV = 80% credibility interval around the true correlation (ρ); 95% CI = 95% confidence interval around the true correlation (ρ); % Var. = percentage of variance that is attributable to statistical artifacts.

Table 4. Summary of studies used to calculate meta-analytic correlations not included by previous meta-analyses

Study	N	Transformational leadership							Role overload			
		Job autonomy	Skill variety	Task identity	Task significance	Job feedback	Intrinsic motivation	Role overload	Skill variety	Task identity	Job feedback	Intrinsic motivation
		Overall effect size							Overall effect size			
Andreassen, Nielsen, Pallesen, and Gjerstad (2019)	1,608	.25										
Arshad, Aftab, and Bukhari (2016)	289								-.63	-.61	.54	
Asmawi, Zakaria, and Chin Wei (2013)	128	.55										
Astrauskaite, Notelaers, Medisauskaitė, and Kern (2015)	320	.30		.40		.57						
Bacha (2014)	100	-.32	.08	.37	-.15	.25						
Bacharach, Bamberger, and Conley (1990)	357 (S1) 467 (S2)									-.22 .09	-.20 -.06	
Bakker, Veldhoven, and Xanthopoulou (2010)	12359										-.13	
Beek, Hu, Schaufeli, Taris, and Schreurs (2012)	760											-.20
Belschak, Den Hartog, and Kalschoven (2015)	141	.56					.47					
Bono (2012)	657						.17					
Castillo, Adell, Alvarez (2018)	266	.27										
Conchie (2013)	251 (S1) 220 (S2)						.31 .35					
Deitcher (2019)	267							.01				

Continued

Table 4. (Continued)

Study	N	Transformational leadership							Role overload			
		Job autonomy	Skill variety	Task identity	Task significance	Job feedback	Intrinsic motivation	Role overload	Skill variety	Task identity	Job feedback	Intrinsic motivation
		Overall effect size							Overall effect size			
Den Hartog and Belschak (2012)	150 (S1) 158 (S2)	.40										
Dwyer and Fox (2006)	145							.20	-.03	-.01		
Evers, Verhoon, and Klaeijsen (2017)	1111	.41										
Fatila (2017)	475	.03	.01	.02	-.00	.06						
Fogarty (2013)	790						.32					
Gaudet (2013)	294							-.18				
Gillet and Vandenberghe (2014)	488	.38	.20			.43						
Gözükara and Simsek (2015)	101	.41										
Grant (2012)	329			.35	.36							
Graves and Sarkis (2018)	251						.17					
Green, Albanese, Shapiro, and Aarons (2014)	285							-.13				
Hammond, Cleveland, O'Neill, Stawski, and Jones Tate (2015)	411	.32										
Hegel (2008)	512							-.37				
Hendrix and Spencer (1989)	443								.39			
Hetland, Hetland, Schou Andreassen, Pallesen, and Notelaers (2011)	661	.49										
Houkes, Janssen, de Jonge, and Bakker (2003)	148											.17

Continued

Table 4. (Continued)

Study	N	Transformational leadership							Role overload			
		Job autonomy	Skill variety	Task identity	Task significance	Job feedback	Intrinsic motivation	Role overload	Skill variety	Task identity	Job feedback	Intrinsic motivation
		Overall effect size							Overall effect size			
Islam, Tariq, and Usman (2018)	563	.48				.49						
Jaffer (2013)	302	.34										
Jain and Duggal (2018)	295	.45										
Janssen, De Jonge, and Bakker (1999)	146											.12
Jensen and Bro (2018)	1481	.17					.16					
Jiang and Tetrick (2016)	374						.30					
Kovjanic, Schuh, Jonas, Quaquebeke, and Van Dick (2012)	410 (S1) 442 (S2)	.69 .65										
Kroon, van Woerkom, and Menting (2017)	382						.29					
Lai, Chang, and Hsu (2012)	161 (S1) 160 (S2) 127 (S3)								.26 .16 .14			
Lee, Idris, and Tuckey (2019)	500					.39						
Lind (2017)	154						.16					
Liu, Fan, Fu, and Liu (2016)	688											-.16
Mahmood, Uddin, and Fan (2019)	234						.57					
Masood and Afsar (2017)	587						.25					
Otto and Schmidt (2007)	217											.03

Continued

Table 4. (Continued)

Study	N	Transformational leadership							Role overload			
		Job autonomy	Skill variety	Task identity	Task significance	Job feedback	Intrinsic motivation	Role overload	Skill variety	Task identity	Job feedback	Intrinsic motivation
		Overall effect size							Overall effect size			
Piccolo and Colquitt (2006)	202						.33					
Price and Weiss (2013)	412						.10					
Rezvani, Khosravi, and Dong (2017)	299	.54										
Salanova, Ilorens, and Cifre (2013)	675 (S1) 397 (S2)	.05 -.02								-.13 -.06		
Schopman, Kalshoven, and Boon (2017)	178						.71					
Shin and Zhou (2003)	290						.35					
Stechmiller (1990)	300							.10	.03			
Svendsen, Unterrainer, and Jönsson (2018)	120	.41										
Thompson (2018)	312	.42	.32	.28	.29	.33						
Wang, Ma, and Zhang (2014)	357		.25	.28	.25	.35						
Waters (2018)	196						.41					
Werner (2018)	309	.58										
Westerberg and Tafvelin (2014)	302	.27								-.26		
Whelan (2011)	311	.41										
Winter and Sarros (2002)	1041									-.24	-.16	
Winter, Taylor, and Sarros (2000)	189								-.00	.20	-.11	
Yizhong, Baranchenko, Lin, Lau, and Ma (2019)	760	.63	.52									
Yunlu (2013)	126											.15

Note. N = number of subjects; S1, S2, S3 = different samples of subjects included in the primary study.

Table 5. Regression coefficients for the hypothesized main effects

Criterion	Predictor	β	SE	95% CI
(1) Job autonomy		.40***	.013	(.37, .43)
(2) Skill variety		.33***	.014	(.30, .36)
(3) Task identity	Transformational leadership	.30***	.014	(.27, .33)
(4) Task significance		.22***	.014	(.19, .25)
(5) Job feedback		.43***	.013	(.40, .46)
Intrinsic motivation	(1) Job autonomy	.09***	.017	(.06, .12)
	(2) Skill variety	.14***	.018	(.10, .18)
	(3) Task identity ^a	NA	NA	NA
	(4) Task significance	.22***	.017	(.19, .25)
	(5) Job feedback	.18***	.016	(.15, .21)
Role overload	(1) Job autonomy	.14***	.016	(.11, .17)
	(2) Skill variety	-.14***	.016	(-.17, -.11)
	(3) Task identity	-.38***	.013	(-.41, -.35)
	(4) Task significance	.76***	.015	(.73, .79)
	(5) Job feedback	-.38***	.015	(-.41, -.35)
Task performance	(1) Role overload	-.23***	.018	(-.27, -.19)
	(2) Intrinsic motivation	.13***	.016	(.10, .16)
	(3) Transformational leadership	.15***	.015	(.12, .18)

Note. β = regression coefficient; SE = standard error; 95% CI = 95% confidence interval; NA= not applicable.

The harmonic mean sample size utilized in path analysis is 4706.

Coefficients in Table 5 were standardized coefficients.

^a Non-significant path representing the relationship between task identity and intrinsic motivation was removed from the path analysis in the final model.

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

Table 6. Moderator analysis by environmental uncertainty for the relationship between transformational leadership and core job characteristics

Moderator	<i>k</i>	<i>N</i>	<i>r</i>	ρ	<u>SDρ</u>	% Var.	95% CI	<i>Z</i>
Overall	53	22,169	.32	.37	.22	5.37	(.31, .43)	
Environmental uncertainty								
Certain environment	14	6,731	.21	.25	.19	6.37	(.14, .35)	
Uncertain environment	9	3,380	.37	.46	.12	17.51	(.37, .54)	-11.47***

Note. *k* = number of independent samples; *N* = number of subjects; *r* = sample-size weighted mean uncorrected correlation; ρ = sample-size weighted mean correlation corrected for unreliability; SD ρ = standard deviation of the true correlation (ρ); % Var. = percentage of variance that is attributable to statistical artifacts; 95% CI = 95% confidence interval around the true correlation (ρ); *Z* = significant test of the difference between the true correlations (ρ).

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

Core job dimensions	Transformational leadership behaviors (Bass, 1985)			
	Idealized influence	Inspirational motivation	Individualized consideration	Intellectual stimulation
Job autonomy	NA	NA	NA	Increasing follower control over work processes
Skill variety	NA	Working beyond basic expectations requires various skills and knowledge.	NA	Being creative requires a wide scope of knowledge.
Task identity	NA	Expanding work responsibilities by including upstream and downstream parts of current tasks Being aware of the connection of their work to the output of the whole group (i.e., group vision and goals) makes followers have a stronger sense of task completion	NA	NA
Task significance	NA	Followers' awareness of their contribution to group goods makes them realize that they are also benefiting group members and customers whose well-being is influenced by group performance.	NA	NA
Job feedback	NA	Conveying meaningful vision and goals functions as a part of feedback as followers can adjust their behaviors toward group vision and goals	Leaders' emphasis on followers' achievement promotes job feedback.	The innovation process generates lessons (i.e., feedback) that facilitate followers' learning.

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