TPM®

TRANSFORMATIONAL LEADERSHIP BEHAVIORS AND AUTONOMOUS MOTIVATION: COMPARING RESULTS OF NORMATIVE AND QUASI-IPSATIVE LEADERSHIP SCORES

JUSTIN VINET
DENIS LAJOIE
UNIVERSITY OF MONCTON, CANADA

The assessment of transformational leadership has been described as problematic. For instance, while transformational leadership has been shown to correlate with autonomous motivation, the literature does not reveal which transformational leadership behaviors are most important in the relationship. This is problematic because while transformational leadership is conceptualized through various leadership behaviors, typical assessment methods of transformational leadership display poor ability to discriminate between these behaviors. Because proponents of quasi-ipsative psychometrics show evidence that forced-choice methods can reduce measurement biases, we examine whether this type of approach might be beneficial in the context of transformational leadership. To this end, we compare the relationship between autonomous motivation and transformational leadership as assessed through normative and quasi-ipsative means. While results are ultimately similar across methods, we find that quasi-ipsative methods are likely ill-suited for transformational leadership as things currently stand.

Keywords: Transformational leadership; Autonomous motivation; Thurstonian IRT; Quasi-ipsative; Fisher *r*-to-*z*.

Correspondence concerning this article should be addressed to Denis Lajoie, University of Moncton, 18 Antonine-Maillet Ave, Moncton, NB E1A 3E9, Canada. Email: denis.lajoie@umoncton.ca

Autonomous motivation is associated with improved performance at work (e.g., Buch et al., 2014), and it is therefore generally to a leader's advantage to behave in ways that favor this kind of motivation among their followers. To that effect, Gagné et al. (2020) showed that transformational leadership precedes employee autonomous motivation temporally (and that this relationship is unidirectional in a longitudinal study), while Jensen and Bro (2018) showed that transformational leadership is associated to intrinsic motivation via satisfaction of the three basic psychological needs identified in Self-Determination Theory (SDT: autonomy, competence, and relatedness; Ryan & Deci, 2017). Despite being linked with autonomous motivation and being the most widely studied form of leadership (Tal & Gordon, 2016), transformational leadership has been the subject of extensive criticism (e.g., Van Knippenberg & Sitkin, 2013).

One area of criticism is that while transformational leadership is conceptualized through multiple behaviors, the most often used transformational leadership questionnaires are purportedly not able to discriminate between these behaviors (Van Knippenberg & Sitkin, 2013). As such, most research findings in this domain present results that conceptualize transformational leadership as a unified construct. This pattern causes an issue in the research literature linking transformational leadership and SDT motivation. For instance, all but one of the articles that we found assessing this relationship studied transformational leadership as a unified construct (see Gagné et al., 2020, or Deci et al., 2017, for recent reviews). Research aiming to examine correlations between transformational leadership and autonomous motivation must therefore find a strategy to increase the

potential for discriminant validity; both in the sense of maximizing the difference in associations between specific behaviors and outcomes, and of minimizing correlations between assessed transformational leadership behaviors. It is namely with these methodological difficulties in mind that we conceptualized the current study.

Firstly, by studying the different behaviors of transformational leadership separately, we proposed to examine whether some are more essential than others in explaining employee motivation. As it stands, Charbonneau et al. (2001) provided the only empirical evidence we found of dimension-level associations between transformational leadership behaviors and a proxy of autonomous motivation. For all three components of their sports-related intrinsic motivation questionnaire, correlations were highest with intellectual stimulation. Secondly, because of the measurement issue mentioned above, we tested the associations between transformational leadership and autonomous motivation in two separate samples. In the first, we used a normative questionnaire of transformational leadership (Rafferty & Griffin, 2004) that has demonstrated evidence of discriminant validity. In the second, we adapted this same questionnaire to a quasi-ipsative format. Fairly strong claims have been made regarding the potential of forced (or semi-forced) choice questionnaires in reducing questionnaire answering biases related to discriminant validity in the domain of personality (e.g., Salgado & Tauriz, 2014). Our paper examines whether a quasi-ipsative approach to the assessment of transformational leadership might in turn improve discriminant validity beyond Rafferty and Griffin's (2004) normative questionnaire by showing the results of this second sample using two different scoring methods: direct raw-score summation of the quasi-ipsative items and Thurstonian Item Response Theory (Thurstonian IRT) estimation.

Theoretical Context

In this section, we first describe the variables in the study and provide a brief overview of the theoretical linkages that associate them. We then detail assessment issues existing in transformational leadership research and describe the potential advantages of quasi-ipsative approaches in this domain.

Transformational Leadership and Motivation

Rafferty and Griffin (2004) described five transformational leadership behaviors. *Vision* is defined as the expression of an idealized picture of the future based on organizational values. *Inspirational communication* is the expression of positive and encouraging messages about the organization. *Supportive leadership* refers to expressing concern for followers. *Intellectual stimulation* consists of enhancing followers' ability to think about problems in new ways. Finally, *personal recognition* is the provision of rewards such as praise and acknowledgment of effort for the achievement of specified goals. Rafferty and Griffin's (2004) results provided support for discriminant validity between these five dimensions of transformational leadership and in relations between the dimensions and various outcomes (not including motivation).

Regarding motivation, Gagné et al. (2015) stated that it is possible to group the motivation types of SDT into three categories. *Controlled motivation* refers to motives that feel like internal or external rewards or punishment for engaging in a task. For example, if a person completes a task to avoid guilt or to obtain a salary, their motives would be considered "controlling." On the other hand, when activities appear to be important or pleasurable in and of themselves (i.e., they help satisfy at least one of the three basic psychological needs), SDT refers to *autonomous motivation*. For example, if a person feels that participation in a task enables them to further a valued cause or to satisfy their need for relatedness, their motives would be considered autonomous. Finally, *amotivation* represents the absence of motivation. Generally speaking,

autonomous motivation is associated with positive outcomes, controlled motivation is associated with mixed outcomes, and amotivation is associated with negative outcomes.

Shamir et al. (1993) offered an influential (Google Scholar counts over 5000 citations as of this writing) and detailed account of how charismatic/transformational leadership affects employee motivation. According to them, transformational leaders motivate followers by a) increasing the intrinsic valence of effort, b) increasing effort-accomplishment expectancies, c) increasing the intrinsic valence of goal accomplishment, d) instilling faith in a better future, and e) creating personal commitment. What these mechanisms have in common is that they involve the followers' self-concept. By linking effort and goals to a follower's values, a leader makes followers personally invested in their tasks because they come to reflect on what they find important. This explanation relates to self-determination theory by the fact that motivation increases when an action becomes aligned with one's values. As such, transformational leaders' subordinates come to autonomously participate in tasks because they personally find these tasks to be important in themselves or linked to important outcomes.

Notably, Shamir et al.'s (1993) theorizing did not clarify the role of specific leader behaviors with regard to outcomes. While one might observe that the vision component of transformational leadership may be the most important driver of autonomous motivation because it is the behavior that contextualizes work activities in a value framework, it should be noted that similar narratives could be constructed for each behavior. For example, inspirational communication might enable positive affect transfer through emotional contagion or affect-as-information (e.g., Van Knippenberg & Van Kleef, 2016). Intellectual stimulation might be particularly important for the satisfaction of competency needs by encouraging the exploration of new intellectual challenges, while support and personal recognition might be particularly important for relatedness needs by favoring perceptions of caring and acknowledgment. In fact, Hannah et al. (2020) demonstrated this general point by providing an in-depth review showing that each transformational leadership behavior can be expected to correlate with environmental mastery and that various behaviors should correlate with positive relationships and with autonomy. To the extent that these three elements of well-being can be equated with the three SDT needs, this means that all transformational leadership behaviors have the potential for indirect correlations with autonomous motivation. However, clarifying these matters empirically requires an assessment method that allows researchers to distinguish between behaviors.

Quasi-Ipsative Assessment of Transformational Leadership

The theoretical confusion surrounding the relationships between specific transformational leadership behaviors and motivation is further compounded by assessment issues. Transformational leadership scores are at a high likelihood of being tainted by the halo bias. For example, Brown and Keeping (2005) found that ratings of transformational leadership given by followers highly correspond to how much followers like their leader. This results in high correlations between the subscales of the leadership instruments (e.g., Van Knippenberg & Sitkin, 2013), suggesting that employees who like their leaders rate them favorably regardless of whether they see them performing the behaviors presumably measured by the questionnaires. This presents a problem for research questions concerning specific transformational leadership behaviors as this phenomenon might reduce the possibility of individually shared variance between specific behaviors and motivation.

While Rafferty and Griffin (2004) reported results that support discriminant validity for their questionnaire (which is admittedly more than can be said for at least some of the transformational leadership questionnaires specifically mentioned by Van Knippenberg and Sitkin, 2013), the factor correlations they reported between their leadership dimensions are still quite high ($.61 \leq r \leq .81$). Because these correlations

may still be inflated by halo bias, forced-choice questionnaires (also known as ipsative questionnaires) may be an advantageous approach in this context. This is because the nature of an ipsative questionnaire makes it impossible for the assessors to give equal scores to many subscales. Of course, the issue with ipsative questionnaires is that they are inappropriate for comparisons between persons (Hicks, 1970). Leader A being more likely to present a clear vision than to stimulate the intellect of their subordinates tells us nothing about whether this leader is more likely to present a vision than Leader B.

Two proposed solutions to the problem of comparisons in ipsative measurement are the use of quasi-ipsative questionnaires and Thurstonian IRT estimation. Quasi-ipsative inventories contain forced-choice items but do not have a predetermined total sum score over the measured dimensions (e.g., Salgado & Tauriz, 2014). The difference between fully ipsative and quasi-ipsative questionnaires can be illustrated with a single forced-choice item. A typical forced-choice item may ask participants to choose which of three stimuli in a triad is most and least typical for them. If all three stimuli have positive valence (1, 1, 1), then a score of 1 is given to the dimension that is chosen as most typical, a score of –1 to the dimension chosen as least typical, and a score of 0 to the dimension that was not chosen. Over the three assessed dimensions, the scores (1, 0, –1) would have a total sum of 0 regardless of which stimuli are chosen as most or least likely. In a quasi-ipsative item, we introduce a stimulus with a different valence than the others (1, 1, –1). The total score over the assessed dimensions can then vary between –2 if the negative stimulus is chosen as most likely (0, –1, –1) and 2 if the negative stimulus is chosen as least likely (0, 1, 1), with a score of 0 being possible if the two positive stimuli are chosen as both most and least likely. As such, while there is still some dependence in the scores of participants (no participants may have maximal or minimal scores on all dimensions — limiting halo bias potential), participants may have higher or lower scores overall, thereby enabling comparisons (Salgado & Lado, 2018).

On the other hand, Thurstonian IRT is a scoring procedure that can be used with ipsative or quasi-ipsative data that may provide an improved correction for the remaining dependence between dimension scores (Brown & Maydeu-Olivares, 2011; Bürkner et al., 2019). In this approach, latent variables representing the construct dimensions are presumed to cause the observed preferences between stimuli in a forced-choice item (the stimuli are the options amongst which the participants choose; the item is the set of stimuli). Brown and Maydeu-Olivares (2011) explained that, in this approach, the residual errors for each comparison containing the same stimuli are permitted to correlate and that the same stimulus is constrained to have the same factor loading with its latent factor regardless of other stimuli being compared. Thurstonian IRT, therefore, permits the estimation of latent scores that extract ipsativity from the estimates.

While Thurstonian IRT is more sophisticated in its correction for score dependencies than the calculation of quasi-ipsative raw scores (QIRS), its adequacy for the applied measurement of transformational leadership by using existing questionnaires is admittedly questionable. Brown and Maydeu-Olivares (2011) and Bürkner et al. (2019) warn that acceptable reliability is more likely when many dimensions are each assessed by many items and are not highly correlated. Rafferty and Griffin's (2004) questionnaire purportedly does have better discriminant validity than other transformational leadership questionnaires; however, it does not assess many dimensions with a large number of items for each. To the best of our knowledge, no transformational leadership questionnaire does. While this questionnaire, therefore, appears to be comparatively advantageous in this context, it can be difficult to predict exactly how problematic the issues outlined above will actually be in an applied setting. We, therefore, opted for an exploratory research design to compare assessment methods in which one sample would be collected using an unmodified normative questionnaire of transformational leadership, and a second sample would use a quasi-ipsative questionnaire and both quasi-ipsative raw scores and Thurstonian IRT scoring.

This exploratory design can help us obtain a clearer view of the relationship between transformational leadership behaviors and employee motivation by confirming (or not) that the effects do not depend

solely on the measurement of the constructs in question. Should the same pattern of effects repeat when using both normative and quasi-ipsative measures of the same constructs, our confidence in the generalizability of these effects would increase. Regardless of the mode of measurement or scoring, unique associations between transformational leadership and motivation that are soundly anchored in "true" scores should replicate across samples. We, therefore, propose a hypothesis even if the research as a whole is exploratory.

Research Question 1: "Which transformational leadership behaviors matter most for autonomous motivation?"

Research Question 2: "Are quasi-ipsative questionnaires advantageous for the study of transformational leadership?"

Hypothesis: the patterns of unique associations between transformational leadership dimensions and motivation will be constant across samples and scoring methods.

METHOD

Participants

The first sample consists of 200 individuals recruited through MTurk. Participants answered a SurveyMonkey questionnaire including the normative version of Rafferty and Griffin's (2004) transformational leadership questionnaire and Gagné et al.'s (2015) SDT questionnaire. The participants in this study received five USD upon completion of the survey if they correctly answered at least four of five simple attention check questions (e.g., "Please select answer 3 *neither agree nor disagree*"). Of the 221 participants who started the survey, 21 were excluded for not completing the study or for failing the attention checks. Inclusion criteria included age (18+), employment, and having a hierarchical superior. In this sample, 38.5% of participants were female, the average age was 34.95 with a standard deviation of 9.09. All participants reported having a high school diploma, and most participants (59.5%) reported having at least one university or college degree. Most of the sample (154) were from the United States. Sample 1 was collected in the spring of 2019. A G*Power (Faul et al., 2009) sensitivity analysis (fixed model, R^2 increase) indicates that a sample of 200 is adequately powered (.80) to detect small-to-medium effect sizes of $f^2 = .07$ when five predictors are tested. Given that the goal of the study was to identify the behaviors that are most strongly related to motivation (rather than identifying all the behaviors that have any unique shared variance with motivation), this appeared reasonable.

The second sample consists of 300 individuals recruited through Prolific. Participants answered a SurveyMonkey questionnaire including Rafferty and Griffin's (2004) transformational leadership questionnaire, this time adapted to a quasi-ipsative format, and Gagné et al.'s (2015) SDT questionnaire. Participants of this study received 1.67 GBP (according to the Prolific dashboard, the average remuneration for the study was 7.59 GBP per hour) upon completion of the questionnaire with similar conditions regarding verification questions as in Sample 1. Of the 309 participants who completed the study, nine were rejected for failing the attention checks. Another 13 participants were then removed from the analyses because they did not fully complete the ipsative questionnaire (for example, they only indicated the most typical behavior in a triad rather than the most and the least typical behaviors). In Sample 2, 52.7% of the sample identified as female, with one participant not indicating their gender. The average age was 38.03 years old with a standard deviation of 10.52. Only two participants reported not having a high-school diploma, and 195 reported having at least one university or college degree. Most of the sample is European, with the three most represented countries being Poland (67), Portugal (59), and the United Kingdom (47). Sample 2 was collected in the

summer of 2020. Maydeu-Olivares and Brown (2010) reported that sample sizes of 200 are sufficient to permit precise unidimensional Thurstonian IRT estimation of latent traits. A sample size of 300 was chosen for our second sample to exceed this minimal requirement in our multidimensional setting, even in the event of missing data. Because item and test characteristics are assumed to be independent of sample characteristics in IRT analyses (e.g., Yang & Kao, 2014), this sample size appeared reasonable.

Material

Transformational Leadership

Rafferty and Griffin's (2004) transformational leadership questionnaire consists of 15 items about the participants' leader (i.e., their immediate hierarchical superior) where they indicate on a scale of 1 to 5 how much they agree with the item. The questionnaire consists of three items per leadership behavior. Vision is measured with items such as "My leader has a clear understanding of where we are going." An item for inspirational communication is "My leader says positive things about the work unit." Intellectual stimulation presents items like "My leader challenges me to think about problems in new ways." An item related to supportive leadership is "My leader behaves in a manner which is thoughtful of my personal needs." Finally, an item that measures personal recognition is "My leader acknowledges improvement in my quality of work." In Sample 1, scale reliabilities range from .73 for vision to .92 for personal recognition. Rafferty and Griffin (2004) provided evidence of excellent model fit indices for a measurement model including their five transformational leadership dimensions along with five outcome variables and a method factor. They further showed that constraining any two transformational leadership dimensions to be perfectly correlated significantly and negatively affects model fit and that different leadership dimensions are differently related to different outcomes, thereby establishing discrimination between each of these factors.

To adapt this questionnaire into a quasi-ipsative format, one question per dimension was reworded to have negative valence (no items were reworded for the vision dimension because it already had a negative item). As per Brown and Maydeu-Olivares' (2011) suggestion, we reworded verbs and adjectives instead of simply adding a "not" in front of the items. The sample items above therefore became, respectively, "My leader says negative things about the work unit," "My leader discourages me from thinking about old problems in new ways," "My leader behaves in a manner which is inattentive of my personal needs," and "My leader disregards improvement in my quality of work."

Table 1 illustrates the five triads composed for this study. As can be gleaned from this table, the triads were constructed to ensure that each leadership behavior was compared to each of the other leadership behaviors in at least one forced-choice triad. We also ensured that each leadership behavior was assessed by two positive stimuli and one negative stimulus. Each of the items in Rafferty and Griffin's (2004) questionnaire was used once across the five triads. Each triad was presented with the stem "Of the three leader behaviors below, which is most typical and which is least typical for your leader?" Cronbach's alphas for the forced-choice scales in Sample 2 were quite low, ranging from .38 (personal recognition) to .57 (intellectual stimulation), although comparisons with typically reported alpha values may not be appropriate as Cronbach's alpha assumes unidimensionality (Lin, 2022); an assumption that is not met with ipsative scores. Nevertheless, we note that other researchers (e.g., Martinez et al., 2021) reported Cronbach's alpha for quasi-ipsative Big Five personality traits that meet values that are typically interpreted as adequate.

TABLE 1
Rafferty and Griffin (2004) subdimension items and item valences in the quasi-ipsative questionnaire

Triad	Vision	Inspirational communication	Intellectual stimulation	Supportive leadership	Personal recognition
1	1	1	1 (–)		
2	3 (already –)			1	1
3		3	2	2 (–)	
4	2	2 (–)			3
5			3	3	2 (–)

Note. The numbers in the table refer to the subdimension item numbers in Rafferty and Griffin's (2004) own Table 1.

Motivation at Work

The Motivation at Work Scale is a 19-item questionnaire that measures motivation according to self-determination theory (Gagné et al., 2015; six items are specific to autonomous motivation). The participants indicate how much they agree on a scale of 1 to 5 with items regarding why they might make efforts at their job. Items related to autonomous motivation include "Because I enjoy this work very much." Scale reliabilities in Sample 1 range from .81 (controlled motivation) to .90 (autonomous motivation) and from .82 (controlled motivation) to .93 (autonomous motivation) in Sample 2. We have no research questions regarding controlled motivation and amotivation, but we include these for the sake of transparency. Gagné et al. (2015) provide evidence of adequate fit for a variety of measurement models (and in a variety of languages) based on this scale. They conclude that researchers may choose to study high-level factors (such as autonomous and controlled motivation) or to break the high-level factors into more specific factors depending on their research question.

Preliminary Data Manipulation

For the normative questionnaires, scale scores were created simply by calculating the mean of the relevant items. Two methods were then used to calculate scale scores for the quasi-ipsative questionnaire. The first, quasi-ipsative raw scores, consisted of attributing a score of +1 to positive stimuli that were chosen as most typical and to negative stimuli chosen as least typical, a score of –1 to positive stimuli that were chosen as least typical and to negative stimuli chosen as most typical, and a score of 0 to items that were neither identified as most nor least typical. Scores were then added such that scale scores could vary between –3 and 3 for each transformational leadership dimension.

Thurstonian IRT estimation for the transformational leadership dimensions was conducted via the Thurstonian IRT R package (Bürkner et al., 2019). The data was fit to the Thurstonian IRT model through Bayesian Markov Chain Monte Carlo sampling, using the *r*Stan engine. The procedure with the default number of iterations (2000) produced a warning that effective sample sizes were small. We increased iterations to 10000 and the model ran without warning. We note that the standard errors for the transformational leadership behavior estimates were quite large. For all dimensions, theta scores (estimated scale scores) obtained

via expected a posteriori estimation ranged from –2.37 to 1.16 (in IRT, a score of 0 is meant to represent a median score). The mean of the standard errors for these values was .67.

RESULTS

As shown in Tables 2 and 3, all transformational leadership scales correlate positively with autonomous motivation. Research Question 1 targets individual associations between transformational leadership dimensions and autonomous motivation. We explored this question via multiple regression analyses, the results of which are reported in Table 4. With regard to our research question, we note that inspirational communication has a statistically significant coefficient in all three regressions (although the inclusion of control variables renders the effect insignificant in one of them), while intellectual stimulation is shown to share independent variance with autonomous motivation in two of the regressions. This fact also provides information toward our hypothesis, which is partially supported: the same pattern of significance is found for two of three regressions, with only one significant difference in the Thurstonian IRT scores.

Research Question 2 asks whether quasi-ipsative questionnaires are advantageous in the context of transformational leadership. This is an open question. One criterion through which an answer can be developed is by determining whether discriminant validity is improved. We first explored discriminant validity by examining the pattern of correlation difference for all correlations between leadership behaviors. More precisely, we used Fisher's *r*-to-*z* transformation (Lowry, 2001/2023) to assess the size and significance of each of these differences. In Table 5, each row represents one of the 10 possible pairs of transformational leadership behaviors, while the columns indicate the two types of scores that are compared. For instance, the correlation between vision and inspiration communication for the normative sample is .63 (see Table 2), and .66 for T-IRT (Thurstonian IRT) scores (see Table 3). The *z*-score of the difference between these two coefficients, which takes sample sizes into consideration, is –.55. This value is negative because the latter correlation is larger than the former. The *z*-scores of Table 5 can be interpreted as usual (i.e., values greater than 1.96 or 2.58 represent statistically significant results at .05 and .01, respectively). Table 5 does not provide support for the idea that T-IRT scores are less correlated than normative scores. On the other hand, quasi-ipsative raw scores do appear to be less correlated than normative or T-IRT scores on average, implying better discriminant validity for this method.

TABLE 2
Correlations between study variables in Sample 1

	1	2	3	4	5	6	7
1. Vision	–						
2. Inspirational communication	.63**	–					
3. Intellectual stimulation	.54**	.72**	–				
4. Supportive leadership	.51**	.75**	.62**	–			
5. Personal recognition	.55**	.74**	.63**	.72**	–		
6. Controlled motivation	.11	.15*	.16*	.15*	.17*	–	
7. Autonomous motivation	.39**	.48**	.51**	.37**	.38**	.32**	–
8. Amotivation	–.42**	–.28**	–.18*	–.19**	–.25**	.16*	–.20**

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

TABLE 3
Correlations between study variables in Sample 2

	1	2	3	4	5	6	7	8	9	10	11	12
1. Vision												
2. Inspirational communication T-IRT	.66**											
3. Intellectual stimulation T-IRT	.51**	.53**										
4. Supportive leadership T-IRT	.60**	.62**	.56**									
5. Personal recognition T-IRT	.75**	.69**	.75**	.82**								
6. Vision QIRS	.94**	.46**	.39**	.50**	.57**							
7. Inspirational communication QIRS	.49**	.94**	.42**	.54**	.57**	.32**						
8. Intellectual stimulation QIRS	.37**	.31**	.84**	.42**	.54**	.32**	.23**					
9. Supportive leadership QIRS	.57**	.64**	.50**	.88**	.69**	.51**	.59**	.27**				
10. Personal recognition QIRS	.49**	.55**	.60**	.56**	.85**	.31**	.51**	.49**	.50**			
11. Controlled motivation	.10	.11	.12*	.09	.12*	.07	.10	.04	.11	.07		
12. Autonomous motivation	.25**	.33**	.23**	.25**	.24**	.22**	.33**	.21**	.24**	.19**	.43**	
13. Amotivation	–.33**	–.33**	–.29**	–.27**	–.35**	–.29**	–.32**	–.19**	–.27**	–.28**	–.21**	–.48**

Note. T-IRT = Thurstonian Item Response Theory; QIRS = quasi-ipsative raw scores.
*$p < .05$; **$p < .01$.

TABLE 4
Results from multiple regressions with leadership behaviors as predictors of autonomous motivation

	Normative		T-IRT		QIRS	
	β	*SE*	β	*SE*	β	*SE*
Vision	.11	.12	.11	.16	.09	.07
Inspirational communication	.23*, [a]	.18	.27**	.14	.30**	.07
Intellectual stimulation	.33**	.13	.16	.16	.15*	.07
Supportive leadership	–.05	.13	.15	.18	.03	.07
Personal recognition	–.02	.13	–.27	.25	–.08	.07
Adjusted R^2	.27		.11		.13	

Note. T-IRT = Thurstonian Item Response Theory; QIRS = quasi-ipsative raw scores.[a] This effect is not statistically significant after the inclusion of participants' age and gender as control variables; the pattern of significance in the table is otherwise unchanged by the inclusion of these control variables.
* $p < .05$; ** $p < .01$.

TABLE 5
Fisher *r*-to-*z* transformation results for the difference between correlation coefficients

Correlation coefficients	Normative T-IRT	Normative QIRS	T-IRT-QIRS
Vision and inspirational communication	–0.55	4.42**	5.5**
Vision and intellectual stimulation	0.45	2.94**	2.75**
Vision and supportive leadership	–1.41	0	1.55
Vision and personal recognition	–3.82**	3.21**	7.77**
Inspirational communication and intellectual stimulation	3.42**	7.26**	4.24**
Inspirational communication and supportive leadership	2.67**	3.18**	0.56
Inspirational communication and personal recognition	1.11	4.18**	3.4**
Intellectual stimulation and supportive leadership	0.99	4.83**	4.24**
Intellectual stimulation and personal recognition	–2.5*	2.21*	5.21**
Supportive leadership and personal recognition	–2.69**	3.86**	7.24**

Note. T-IRT = Thurstonian Item Response Theory; QIRS = quasi-ipsative raw scores.
* $p < .05$; ** $p < .01$.

We further explored discriminant validity by examining the range of correlations between the leadership behavior scores and autonomous motivation for all scoring procedures. In Sample 1, the correlations between normative transformational leadership scores and autonomous motivation range between .37 and .51 (Fisher's *r*-to-*z* transformation result of 1.73 for the difference between these two values). In Sample 2, these same correlations range between .23 and .33 ($z = 1.29$) for the Thurstonian IRT estimated scale scores, and between .19 and .33 ($z = 1.79$) for the quasi-ipsative raw scores. As the *z*-scores for the difference

between the largest and smallest correlations for each scoring method are not significant, we can determine that none of the scoring methods permit a particularly wide range of correlations with autonomous motivation. We therefore cannot conclude that quasi-ipsative approaches provide an advantage for discriminant validity with regard to correlations with autonomous motivation.

DISCUSSION

This study aimed to test the value of different assessment methods in identifying relationships between specific transformational leadership behaviors and autonomous motivation. This was done by using a Likert-style questionnaire in conjunction with a quasi-ipsative questionnaire of the same construct to control for the halo bias often found in the former. Our results show that the two measurement scales provide a similar view of the above-mentioned relationships. Inspirational communication was found to share unique variance with autonomous motivation in both of the samples and with all three scoring methods (although one of these effects did not remain significant after the inclusion of control variables), while intellectual stimulation was also shown to have such relationships in both samples, albeit only with two of the scoring methods. These results echo the importance of intellectual stimulation found by Charbonneau et al. (2001) in the sports context.

Theoretical Implications

Identifying which transformational leadership behaviors are most important for autonomous motivation can help provide some clarification of transformational leadership theory. Our answer to our first research question (concerning which transformational leadership behaviors share the most unique variance with autonomous motivation) is that two behaviors (inspirational communication and intellectual stimulation) in particular appear to be most responsible for the relationship between transformational leadership and autonomous motivation. As we described in the introduction, we have sufficient theory to understand why these transformational leadership behaviors may be important for autonomous motivation (e.g., affect-based or psychological-needs-based processes) but not enough to understand why they would be more important than the other behaviors.

One avenue that appears worth exploring based on our results is the possibility that these two behaviors are most linked with autonomous motivation on account of reflecting both active and positive affect content (e.g., the positive PANAS quadrant; Watson et al., 1988). As far as transformational leadership behaviors go, we would intuitively posit that a vision is affectively neutral (its valence and potency potentially being determined largely by content and delivery), while support and recognition may lead to positive affect that is low in activation. On the other hand, the items related to inspirational communication and intellectual stimulation contain explicit reference to positivity, challenge, and pride. Given that autonomous motivation is, by definition, affectively positive and high in activation, it may be that the main way in which leaders can foster this type of motivation is through behaviors that are associated with a positive and active affective response. Of course, the question of whether inspirational communication and intellectual stimulation are more positive-and-active than other transformational leadership behaviors is an empirical one that could be tested in future studies.

Practical Implications

The more obvious advice for managers based on our results is that inspirational communication and intellectual stimulation appear to be the most promising transformational leadership behaviors for raising autonomous motivation in subordinates. On the other hand, this may not be the whole story. While these two behaviors appear to have the most weight for autonomous motivation in a sample of presently employed participants, the longitudinal associations between leadership and motivation may paint a different dynamic. For example, the Attraction-Selection-Attrition model (Schneider, 1987) could suggest that a prospective employee may never join a team if they disagree with the team's goals (or vision) or if those goals are unclear. Furthermore, while an increase in the quantity and quality of motivation can certainly be a boon, it needs to be directed toward a common goal, for example articulated in a vision, if it is to be productive.

Methodological Implications

Our study suggests some practical advantages and limitations of a research design in which the same variables are measured in different samples but with variations in method. True effects should not be method-dependent. As such, confirming effects with multiple methods can only be an advantage. However, this advantage depends on the validity of the methods used. Our study appears to be the first to examine the use of a quasi-ipsative questionnaire to assess leadership behaviors. We find that this approach led to scores with low evidence of internal coherence. It is possible that the low number of items in this questionnaire leads to a more pessimistic view of reliability than an assessment of test-retest correlation might. Nevertheless, in light of both low Cronbach's alphas for the quasi-ipsative raw scale scores and very large standard errors for the Thurstonian IRT scores (95% confidence intervals of scores would cover more than half of the observed range), it appears strongly advisable to include more items (e.g., Bürkner et al., 2019). While the idea of asking (essentially) the same questions in different ways to extract method biases remains appealing, current transformational leadership questionnaires are unlikely to be a good fit for a forced-choice approach. Our ultimate answer to our second research question, even in light of partial support for increased discriminant validity, is therefore that the potential advantages of quasi-ipsative questionnaires of transformational leadership remain to be demonstrated.

Moreover, while we feel that our study illustrates the value of studying distinct leadership behaviors rather than a unitary transformational leadership construct (different behaviors indeed appear to have different outcomes), there is still a separate question that we cannot answer based on our data. To wit: exactly how much discrimination *should* there be between transformational leadership behaviors? Presumably, all "positive" leadership behaviors will tend to correlate, but if we hypothesize "types" of positive leaders, we should expect some sets of behaviors to correlate more highly within the set than with behaviors outside the set. Transformational leadership behaviors have been identified as a useful set of leadership behaviors, but more work is needed to establish whether they should indeed be considered as a set at all (Van Knippenberg & Sitkin, 2013). Interestingly, the phenomenon of highly correlated leadership behaviors transcends transformational leadership behaviors (e.g., high correlations between transformational leadership and other types of leadership behaviors; Van Knippenberg & Sitkin, 2013). If future researchers ever wish to test quasi-ipsative measurement to limit halo bias in leadership assessment at large, we advise, based on our results, that short and targeted assessment should not be the baseline expectation.

Study Limitations

The fact that this study had the dual aim of providing a substantive contribution and a methodological contribution comes with challenges. While it is comforting that the results were somewhat similar across samples, we cannot quantify how much uncertainty remains in our conclusions. Thurstonian IRT scores did not lead to the same conclusions as the other two scoring methods. However, these scores appear to be fairly unreliable in any case. We learned that the questionnaire is inappropriate for the method but at a certain cost to our confidence regarding the substantive question. Moreover, one of the effects in the normative sample does not remain significant after the inclusion of control variables, casting doubt on its importance. On the other hand, the use of *p*-values of .05 as a cut-off for significance is an arbitrary convenience. With larger sample sizes, it is quite likely that any uniquely shared variance may appear significant.

Our results should also be interpreted in light of GLOBE project results, which show that different leadership behaviors are seen as more or less preferable depending on culture (Dorfman et al., 2012). We cannot exclude that different transformational leadership behaviors may be more important for autonomous motivation in different cultures. Our cross-sectional data does not allow for conclusions on causality. While Gagné et al. (2020) found that transformational leadership precedes autonomous motivation over a time lag of 6 to 18 months, it remains possible that leaders may tend to react with enthusiasm to already motivated employees.

Conclusion

In summary, inspirational communication and intellectual stimulation appear to be the transformational leadership behaviors most likely to be linked with autonomous motivation. In our samples, participants were asked to comment on their immediate leaders. It is possible that distal leaders have a different role that could moderate the importance of individual leadership behaviors. For example, vision might be a more important behavior when it comes from members of the top management team than from one's immediate supervisor. It is also possible that there are interaction effects between transformational leadership behaviors or between these behaviors and characteristics of the situation that could contribute to explaining autonomous motivation.

References

Brown, A., & Maydeu-Olivares, A. (2011). Item response modeling of forced-choice questionnaires. *Educational and Psychological Measurement*, *71*(3), 460-502. https://doi.org/10.1177/0013164410375112

Brown, D. J., & Keeping, L. M. (2005). Elaborating the construct of transformational leadership: The role of affect. *The Leadership Quarterly*, *16*(2), 245-272. https://doi.org/10.1016/j.leaqua.2005.01.003

Buch, R., Kuvaas, B., Dysvik, A., & Schyns, B. (2014). If and when social and economic leader-member exchange relationships predict follower work effort: The moderating role of work motivation. *Leadership and Organization Development Journal*, *35*(8), 725-739. https://doi.org/10.1108/LODJ-09-2012-0121

Bürkner, P. C., Schulte, N., & Holling, H. (2019). On the statistical and practical limitations of Thurstonian IRT models. *Educational and Psychological Measurement*, *79*(5), 827-854. https://doi.org/10.1177/0013164419832063

Charbonneau, D., Barling, J., & Kelloway, E. K. (2001). Transformational leadership and sports performance: The mediating role of intrinsic motivation. *Journal of Applied Social Psychology*, *31*(7), 1521-1534. https://doi.org/10.1111/j.1559-1816.2001.tb02686.x

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-determination theory in work organizations: The state of a science. *Annual Review of Organizational Psychology and Organizational Behavior*, *4*, 19-43. https://doi.org/10.1146/annurev-orgpsych-032516-113108

Dorfman, P., Javidan, M., Hanges, P., Dastmalchian, A., & House, R. (2012). GLOBE: A twenty year journey into the intriguing world of culture and leadership. *Journal of World Business*, *47*(4), 504-518. https://doi.org/10.1016/j.jwb.2012.01.004

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Van den Broeck, A., Aspeli, A. K., Bellerose, J., Benabou, C., Chemolli, E., Güntert, S. T., Halvari, H., Indiyastuti, D. L., Johnson, P. A., Molstad, M. H., Naudin, M., Ndao, A., Olafsen, A. H., Roussel, P., Wang, Z., & Westbye, C. (2015). The Multidimensional Work Motivation Scale: Validation evidence in seven languages and nine countries. *European Journal of Work and Organizational Psychology*, *24*(2), 178-196. https://doi.org/10.1080/1359432X.2013.877892

Gagné, M., Morin, A. J., Schabram, K., Wang, Z. N., Chemolli, E., & Briand, M. (2020). Uncovering relations between leadership perceptions and motivation under different organizational contexts: A multilevel cross-lagged analysis. *Journal of Business and Psychology*, *35*(6), 713-732. https://doi.org/10.1007/s10869-019-09649-4

Hannah, S. T., Perez, A. L., Lester, P. B., & Quick, J. C. (2020). Bolstering workplace psychological well-being through transactional and transformational leadership. *Journal of Leadership and Organizational Studies*, *27*(3), 222-240. https://doi.org/10.1177/1548051820933623

Hicks, L. E. (1970). Some properties of ipsative, normative, and forced-choice normative measures. *Psychological Bulletin*, *74*(3), 167-184. https://doi.org/10.1037/h0029780

Jensen, U. T., &Bro, L. L. (2018). How transformational leadership supports intrinsic motivation and public service motivation: The mediating role of basic need satisfaction. *The American Review of Public Administration*, *48*(6), 535-549. https://doi.org/10.1177/0275074017699470

Lin, Y. (2022). Reliability estimates for IRT-based forced-choice assessment scores. *Organizational Research Methods*, *25(*3), 575-590. https://doi.org/10.1177/1094428121999086

Lowry, R. (2023). *Significance of the difference between two correlation coefficients.* http://vassarstats.net/rdiff.html (Original work published 2001).

Maydeu-Olivares, A., & Brown, A. (2010). Item response modeling of paired comparison and ranking data. *Multivariate Behavioral Research*, *45*(6), 935-974. https://doi.org/10.1080/00273171.2010.531231

Martínez, A., Moscoso, S., & Lado, M. (2021). Faking effects on the factor structure of a quasi-ipsative forced-choice personality inventory. *Revista de Psicología del Trabajo y de las Organizaciones*, *37*(1), 1-10. https://doi.org/10.5093/jwop2021a

Rafferty, A. E., & Griffin, M. A. (2004). Dimensions of transformational leadership: Conceptual and empirical extensions. *The Leadership Quarterly*, *15*(3), 329-354. https://doi.org/10.1016/j.leaqua.2004.02.009

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.

Salgado, J. F., & Lado, M. (2018). Faking resistance of a quasi-ipsative forced-choice personality inventory without algebraic dependence. *Journal of Work and Organizational Psychology*, *34*(3), 213-216. https://doi.org/10.5093/jwop2018a23

Salgado, J. F., & Tauriz, G. (2014). The Five-Factor Model, forced-choice personality inventories and performance: A comprehensive meta-analysis of academic and occupational validity studies. *European Journal of Work and Organizational Psychology*, *23*(1), 3-30. https://doi.org/10.1080/1359432X.2012.716198

Schneider, B. (1987). The people make the place. *Personnel Psychology*, *40*(3), 437-453. https://doi.org/10.1111/j.1744-6570.1987.tb00609.x

Shamir, B., House, R. J., & Arthur, M. B. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organization Science*, *4*(4), 577-594. https://doi.org/10.1287/orsc.4.4.577

Tal, D., & Gordon, A. (2016). Leadership of the present, current theories of multiple involvements: A bibliometric analysis. *Scientometrics*, *107*(1), 259-269. https://doi.org/10.1007/s11192-016-1880-y

Van Knippenberg, D., & Sitkin, S. B. (2013). A critical assessment of charismatic transformational leadership research: Back to the drawing board? *Academy of Management Annals*, *7*(1), 1-60. https://doi.org/10.5465/19416520.2013.759433

Van Knippenberg, D., & Van Kleef, G. A. (2016). Leadership and affect: Moving the hearts and minds of followers. *Academy of Management Annals*, *10*(1), 799-840. https://doi.org/10.5465/19416520.2016.1160515

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. https://doi.org/10.1037/0022-3514.54.6.1063

Yang, F. M., & Kao, S. T. (2014). Item response theory for measurement validity. *Shanghai Archives of Psychiatry*, *26*(3), 171-177. https://doi.org/10.3969/j.issn.1002-0829.2014.03.010