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Article

How does transformational leadership relate to leaders' own well-being and flow?

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Abstract: Transformational leadership research has overwhelmingly examined how leaders shape followers' outcomes, leaving little attention to how enacting leadership relates to the leader's own psychological functioning. This exploratory, cross-sectional study examines whether transformational leadership is associated with four psychological resources in the leader — self-efficacy, intrinsic job satisfaction, extrinsic job satisfaction, and work engagement — and whether these resources are differentially associated with two forms of the leader's own positive experience. Two structural models differing only in outcome were estimated and compared on the same sample: a primary model with subjective well-being as the outcome, and a rival model with flow as the outcome. Data were collected from middle managers and supervisors in the footwear manufacturing industry of the Bajío region, Mexico (n = 104 managers with complete data) and analysed using Partial Least Squares Structural Equation Modelling with bootstrapped confidence intervals. Transformational leadership was positively associated with all four resources, although the associations with intrinsic satisfaction, extrinsic satisfaction and engagement were sensitive to a conservative common-method adjustment, which may over-correct, and its direct association with both outcomes was not distinguishable from zero. Of the four resources, only extrinsic satisfaction had a significant indirect association with subjective well-being, consistent with a pattern previously reported in this same population, whereas engagement and intrinsic satisfaction had significant indirect associations with flow. A paired bootstrap indicated that the pattern of associations differed between the two outcomes for engagement, intrinsic satisfaction and extrinsic satisfaction; this contrast is exploratory, and the flow findings are preliminary because flow was measured with two indicators and its discriminant validity from engagement was not established. Given the cross-sectional, self-reported design, the results are consistent with, but cannot demonstrate, a resource gain-spiral process. The findings contribute to the small stream of research on leader-centred outcomes of transformational leadership and suggest that leader-related resources may relate differently to different forms of positive experience, with tentative implications for leadership-development programmes.

Keywords: self-efficacy; job satisfaction; work engagement; conservation of resources; job demands–resources model; middle managers; mexico; PLS-SEM

1. Introduction

Transformational leadership is among the most extensively studied constructs in organisational behaviour: leaders who articulate an inspiring vision, stimulate followers intellectually and attend to individual needs improve followers' engagement, well-being and performance (Hildenbrand et al., 2018; Koveshnikov et

al., 2020; Song et al., 2022). Four decades of research have framed transformational leadership almost exclusively as something a leader does to others. A smaller stream asks how it relates to the leader who enacts it: Nielsen (2013) linked transformational behaviours to leaders' own work engagement, Mencl et al. (2016) linked transformational attributes to leaders' own well-being, and daily-diary, person-centred and cross-lagged studies have shown that leadership behaviour and leader well-being are reciprocally related (Geibel et al., 2022; Wittmers et al., 2024, 2025). This study extends that stream by asking not only whether transformational leadership relates to the leader's own flourishing, but through which psychological resources, and towards which kind of flourishing.

The first question matters because leadership research has often modelled psychological resources such as self-efficacy as antecedents of transformational behaviour (e.g., Fitzgerald & Schutte, 2010), rather than as outcomes that the behaviour itself might generate. Conservation of Resources theory (Hobfoll, 1989, 2001) suggests that resource gains, like resource losses, tend to spiral, so that successfully enacting leadership could also replenish the leader's resources (Section 2.1). Because the data are cross-sectional, this reversed pathway cannot be tested directly; the study examines instead whether transformational leadership is positively associated with the leader's own self-efficacy, job satisfaction and engagement, as a gain-spiral account would lead one to expect, while recognising that such associations are equally compatible with the conventional direction or with reciprocal relationships.

The second question is equally underexplored. Studies of transformational leadership and well-being usually treat well-being as a single, undifferentiated outcome, yet well-being research distinguishes an evaluative, retrospective judgement about one's life (subjective well-being; Diener et al., 1999) from momentary, experiential states of absorption and enjoyment (flow; Csikszentmihalyi, 1990). Moreover, when several psychological resources are modelled as parallel mediators of a leadership-to-well-being pathway, they rarely matter equally: Saruhashi et al. (2025) found that only two of three resources carried a significant indirect effect of transformational leadership on employees' subjective well-being. Different resources associated with the same leadership behaviour may therefore relate to different kinds of positive experience — a possibility that single-outcome designs cannot detect.

Drawing on the Job Demands–Resources tradition of modelling transformational leadership as a resource-generating mechanism (Bakker & Demerouti, 2017; Berger et al., 2019; Katou et al., 2022; Xanthopoulou et al., 2007), this study proposes that transformational leadership is associated with four psychological resources in the leader — self-efficacy, intrinsic job satisfaction, extrinsic job satisfaction and work engagement — and estimates two structural models with an identical antecedent structure but different outcomes: a primary model culminating in subjective well-being and a rival model culminating in flow. Comparing the two shows which resources are associated with which kind of leader flourishing. Data were collected from middle managers and supervisors in the footwear manufacturing industry of the Bajío region, Mexico (n = 104), and analysed with Partial Least Squares Structural Equation Modelling.

The study makes three contributions, each of which should be read in light of its cross-sectional, self-reported design. It models four resources as parallel, simultaneously estimated mediators between transformational leadership and the leader's own outcomes, whereas earlier leader-centred studies typically examine a single resource or outcome; it provides exploratory evidence, from two models with

different outcomes estimated on the same respondents, that these resources are not uniformly associated with every form of positive experience; and it illustrates a rival-outcome comparison, complementing the more familiar rival-predictor comparisons in the PLS-SEM literature, as a way of probing the specificity of resource-based mediation. The extrinsic-satisfaction-to-well-being pathway was previously reported on the same sample of managers (Soto-Pérez & Briseño, 2026) and is therefore not an independent finding; what is new is the upstream role of transformational leadership, the parallel four-resource structure and the rival-outcome comparison.

2. Theoretical framework and hypothesis development

2.1. Transformational leadership and the leader's own psychological resources

Research on transformational leadership (TL) has examined mainly how leaders shape the psychological states and performance of their followers (Hildenbrand et al., 2018; Koveshnikov et al., 2020; Song et al., 2022). The leader-centred stream reviewed in the Introduction (Geibel et al., 2022; Mencl et al., 2016; Nielsen, 2013; Wittmers et al., 2024, 2025) suggests that enacting it is also related to the leader's own engagement and well-being, and that leadership behaviour and leader well-being are reciprocally intertwined.

The present study extends this stream with a specific resource-gain account: enacting transformational leadership may operate as a mastery experience that replenishes, rather than merely depletes, the leader's own resources. Conservation of Resources theory (COR; Hobfoll, 1989, 2001) holds that resource gains, not only resource losses, form self-reinforcing spirals, because possessing and successfully deploying a resource facilitates the acquisition of further resources. Byrne et al. (2014) documented the loss-spiral counterpart, showing that leaders' diminished psychological resources shape their subsequent leadership behaviour; if losing resources undermines leadership, successfully enacting it — a repeated mastery experience in Bandura's (1997) sense — should replenish them. A spiral is a dynamic process that cannot be tested with cross-sectional data; the models below therefore examine whether the pattern of associations expected under a gain-spiral account is present, not the spiral itself.

2.2. Transformational leadership and self-efficacy

Self-efficacy — the belief in one's capability to execute a course of action successfully (Bandura, 1997) — is frequently modelled as an antecedent of transformational behaviour, on the assumption that leaders must first believe they can lead before they act accordingly (e.g., Fitzgerald & Schutte, 2010, who showed experimentally that raising managers' leadership self-efficacy increased their transformational leadership). The reverse association is also plausible: leading transformationally — inspiring others, framing change as opportunity, encouraging new perspectives — may constitute a repeated mastery experience and would therefore be expected to be positively associated with, and over time to strengthen, the leader's self-efficacy.

H_1: Transformational leadership is positively related to leaders' self-efficacy.

2.3. Transformational leadership, job satisfaction, and engagement

Transformational behaviour also plausibly enriches the leader's own job in the sense of the Job Characteristics Model (Hackman & Oldham, 1976): recognising others, framing problems from new angles and shaping team change add task

significance and variety to the leader's role. This enrichment is expected to extend to both facets of job satisfaction distinguished by Self-Determination Theory (Deci & Ryan, 2000; operationalised here following Yang & Hwang, 2014): intrinsic satisfaction through the meaningfulness of the leadership role itself, and extrinsic satisfaction through the recognition and relational capital that transformational behaviour tends to generate.

H_2: Transformational leadership is positively related to leaders' intrinsic job satisfaction.

H_3: Transformational leadership is positively related to leaders' extrinsic job satisfaction.

Finally, enacting transformational leadership is itself an absorbing, effortful activity, consistent with the Job Demands–Resources model's proposition that engagement is fuelled by the deployment of personal and job resources (Xanthopoulou et al., 2007; Bakker & Demerouti, 2017).

H_4: Transformational leadership is positively related to leaders' own work engagement.

2.4. From psychological resources to well-being

Following the gain-spiral logic outlined above, the four resources associated with transformational leadership — self-efficacy, intrinsic satisfaction, extrinsic satisfaction, and engagement — are each expected to relate positively to the leader's subjective well-being (Diener et al., 1999), operationalised here following Bhatti et al. (2020).

H_5: Leaders' self-efficacy is positively related to their subjective well-being.

H_6: Leaders' intrinsic job satisfaction is positively related to their subjective well-being.

H_7: Leaders' extrinsic job satisfaction is positively related to their subjective well-being.

H_8: Leaders' work engagement is positively related to their subjective well-being.

Because the four resources are hypothesised to operate through the same gain-spiral mechanism, the association between transformational leadership and subjective well-being is expected to be transmitted indirectly, through these resources. With cross-sectional data, mediation is evaluated statistically and is not by itself evidence of a causal sequence.

H_9: Transformational leadership is indirectly related to subjective well-being through self-efficacy, intrinsic job satisfaction, extrinsic job satisfaction, and engagement.

2.5. A rival outcome: flow

Life-satisfaction-type items (Bhatti et al., 2020) capture a predominantly evaluative, cognitive judgement about one's life as a whole (Diener et al., 1999). The same leader-related resources may instead, or additionally, manifest in a momentary, experiential state of task absorption: flow (Csikszentmihalyi, 1990). To examine this possibility, a rival structural model with the same antecedent structure replaces subjective well-being with flow (Tuncer, 2021) as the outcome. Hypotheses H5r–H9r mirror H5–H9 with flow substituted for subjective well-being; thus H9r states that transformational leadership is indirectly related to flow through self-efficacy, intrinsic job satisfaction, extrinsic job satisfaction and engagement. In the spirit of the person-centred approach of Wittmers et al. (2024), the comparison does not assume a single, undifferentiated form of leader benefit, but examines with which of two plausible

outcomes — evaluative well-being or experiential flow — the same resources are more strongly associated.

3. Materials and methods

3.1. Research design and sample

The study used a cross-sectional, quantitative, explanatory design estimated through Partial Least Squares Structural Equation Modelling (PLS-SEM). Data were collected via self-administered questionnaires from middle managers and supervisors in the footwear manufacturing industry of the Bajío region, Mexico. Two structural models with an identical antecedent structure — a primary model with subjective well-being (SWB) and a rival model with flow as the endogenous outcome — were estimated on exactly the same respondents.

Human resources directors (in large firms) or general managers (in medium-sized and small firms) were contacted first, and those who authorised participation facilitated contact with their middle managers. In the first half of 2024, questionnaires were sent by email to the middle managers and, separately, to each manager's direct supervisor; respondents were required to hold a middle-management position with direct supervisory responsibilities. The data belong to a broader research programme on middle managers' well-being, engagement and performance and have been used in other studies addressing different research questions (Soto-Pérez & Briseño, 2026); the models, hypotheses and analyses reported here are original to this manuscript.

Of the 150 managers invited, 136 returned questionnaires (a response rate of about 90%), and 104 (76.5% of respondents) completed all items of both models; all results are based on these 104 managers, so the two models are estimated, and can be compared, on exactly the same observations. The remaining 32 respondents had not received the flow items, which were added to the questionnaire after data collection had begun; they are missing on flow by design and were excluded listwise. No other variable in the models had missing values. The sample satisfies the ten-times rule (Hair et al., 2011), since at most five structural paths are directed at any construct. Under the inverse square root method (Kock & Hadaya, 2018), about 100 observations are needed to detect a path coefficient of about .25 at the 5% significance level with 80% power; the sample is therefore adequate only for paths of at least that magnitude, and smaller non-significant paths should not be interpreted as absent.

Because the 32 excluded respondents were not missing at random, they were compared with the analytic sample on the 20 indicators measured in both groups. They reported higher scores on all 20 indicators (standardised mean differences from $d = -.02$ to $d = -.59$, negative values denoting higher scores in the excluded group); nine of the 20 differences were significant at $p < .05$ in Welch's t-tests (eight in Wilcoxon–Mann–Whitney tests; no correction for multiple comparisons), concentrated in the intrinsic and extrinsic satisfaction items, one engagement item (saE3) and one subjective well-being item (SWB1). The analytic sample therefore reports somewhat lower satisfaction and well-being, and the estimates should not be generalised to the full set of 136 respondents (Section 5.3).

The analytic sample comprised 69 men (66.3%) and 35 women (33.7%). Age, tenure, organisational size and span of control were not collected in the original survey, which is acknowledged as a limitation.

3.2. Measures

All constructs were measured with previously validated, multi-item reflective scales rated on a five-point Likert-type scale (1 = strongly disagree, 5 = strongly

agree), and all were self-rated; transformational leadership items were worded in the first person, so that each manager rated his or her own leadership behaviour. Transformational leadership was measured with items adapted from Rafferty and Griffin (2004); one retained item (TL5) corresponds in content to contingent reward, which is classified as a transactional rather than a transformational behaviour (Podsakoff et al., 1990; see Section 5.3). Self-efficacy was measured with items adapted from Su and Cheng (2019); intrinsic and extrinsic job satisfaction with items adapted from Yang and Hwang (2014); subjective well-being with items adapted from Bhatti et al. (2020), whose scale draws on the Satisfaction with Life Scale (Diener et al., 1985); work engagement with items adapted from Hamari et al. (2016); and flow, used only in the rival model, with items adapted from Tuncer (2021). The engagement, self-efficacy and flow items come from instruments developed in game-based learning, virtual-laboratory learning and social-commerce settings, respectively; their content validity for managerial work has therefore not been established independently, and they were not compared with established work-engagement instruments. The original instruments, published in English, were translated into Spanish and reviewed by the research team before administration; no back-translation or pilot validation of the translated versions is reported. Item-level descriptive statistics are given in Appendix A (Table A1), and the item wording (Spanish as administered, with an English translation) and response anchors in Appendix B.

3.3. Data screening and measurement purification

The working data file used in preliminary screening contained four summary rows (mean, standard deviation, skewness and kurtosis) appended beneath the individual responses. These rows were removed before any model was estimated, using a rule requiring every valid response to be an integer within the instrument's 1–5 range; a simple range check would not have sufficed, because the mean row fell within the valid range by coincidence. The cleaned file contained 136 individual responses, from which the 104 complete cases used in all analyses were drawn.

Measurement models were purified iteratively following the loading-based criteria recommended by Hair et al. (2022). Purification was carried out during preliminary estimation on the 136 cleaned responses (for the flow indicators, on the 104 responses that contained them); the retained indicators were then fixed, and all models reported below were estimated on the n = 104 analytic sample. Indicators with standardised outer loadings below .40 were removed outright (TL4, SWB4). Indicators loading between .40 and .70 — below the .70 benchmark at which an indicator explains at least 50% of its construct's variance (Barroso et al., 2010) — were retained only where their removal would have left a construct with fewer than the three indicators recommended for reflective measurement models. This rule, adopted by the authors rather than prescribed by Hair et al. (2022), preserved TL5, SE4 and saE1 despite loadings below .70, while permitting the removal of TL1, TL6 and SE2, whose standardised outer loadings in the initial item pool (TL1 = .529; TL6 = .675; SE2 = .513) also fell between .40 and .70; consistent with the rule, their removal left transformational leadership and self-efficacy with three indicators each (TL2, TL3, TL5; SE1, SE3, SE4). The negatively worded engagement items saE4 and saE5 were recoded following standard practice before purification and were also removed during it. In the rival model, saE1's loading fell below the .40 removal threshold (.37); it was retained as an exception to the rule, because its removal would have left engagement with only two indicators, although the main conclusions hold without it (Section 4.5; Table A6). This exception was not needed in the primary

model, where saE1 (.57) was retained under the general rule. The final measurement model retained three indicators each for transformational leadership, self-efficacy, engagement and subjective well-being, and all four original indicators for intrinsic and extrinsic job satisfaction; sensitivity analyses removing each low-loading indicator in turn are reported in Section 4.5.

For the rival model, two flow indicators (Fl2, Fl3) were excluded on distinct grounds: their correlations with the remaining two indicators (Fl1, Fl4) were close to zero (r = .01 to .03) rather than negative, ruling out simple reverse-coding and indicating that the four-item flow scale did not behave as unidimensional in this sample. A plausible explanation is that Fl1 and Fl4 capture the enjoyment/time-distortion facet of flow, whereas Fl2 and Fl3 capture an attentional-narrowing facet (losing awareness of one's surroundings, forgetting other tasks) that, in an industrial manufacturing context, may carry workplace-safety connotations rather than positive ones. The retained two-item construct therefore covers only the enjoyment/time-distortion facet of flow, a reduction in content coverage acknowledged as a limitation.

Because all constructs were collected from a single self-report source at one time point, common method variance was examined with three complementary procedures, none of which can rule it out entirely. First, Kock's (2015) full collinearity test, applied to composite scores of all constructs plus an unrelated random variable, yielded variance inflation factors (VIFs) from 1.15 to 1.88 across the two models, well below the recommended threshold of 3.3, as in prior work with this population (Soto-Pérez & Briseño, 2026). Second, because the instrument contains no theoretically unrelated marker variable, a marker-variable proxy was used following Lindell and Whitney (2001) and the conservative variant described by Malhotra et al. (2006): the second-smallest absolute correlation among unweighted composites of the study constructs (means of the standardised indicators; r = .22; Table A7) was taken as an estimate of method variance, and the remaining correlations were adjusted accordingly. Third, self-rated engagement was correlated with supervisor-rated engagement among the managers with both ratings (Section 4.5).

3.4. Analytical procedure

Models were estimated with the PLSsemEngine R package (version 1.3.0; Soto-Pérez, 2026), using Mode A estimation for all reflective constructs and the factorial inner weighting scheme, following the two-step approach of assessing the measurement model and then the structural model (Hair et al., 2022; López-Hernández et al., 2023). Convergent validity was evaluated via composite reliability (CR ≥ .70) and average variance extracted (AVE ≥ .50); discriminant validity via the heterotrait–monotrait ratio of correlations (HTMT < .85; Henseler et al., 2015; Ab Hamid et al., 2017), complemented by bootstrap confidence intervals and the Fornell–Larcker criterion. Structural paths were tested through bootstrapping with 5,000 resamples, and predictive relevance was assessed via PLSpredict (Shmueli et al., 2019) using ten-fold cross-validation.

Comparisons between models require the bootstrap draws of both models on identical resampled rows, so they were computed with a minimal Mode A PLS-PM routine written in R (path weighting scheme), which reproduced the engine's loadings, path coefficients and R^2 to within .02 on these data. Percentile 95% confidence intervals from 5,000 paired resamples (2,000 for the sensitivity analyses) were obtained for (a) the direct, specific indirect, total indirect and total effects of transformational leadership on each outcome; (b) the differences between homologous path coefficients (β on subjective well-being minus β on flow) and between the two R^2

values; and (c) contrasts between such differences, which test whether the pattern of associations differs across outcomes rather than merely whether a path is significant in one model and not in the other (Gelman & Stern, 2006). Mediation was classified following Zhao et al. (2010), with the variance accounted for (VAF) reported descriptively; because standardised coefficients of constructs with different reliability are not strictly comparable, these comparisons are exploratory. HTMT confidence intervals and cross-loadings were obtained with the same routine, whose R code was drafted with AI assistance and run by the authors on the original data file (see the AI usage statement).

4. Results

4.1. Measurement model assessment

Table 1 presents the measurement model results for the primary (SWB) model. All constructs met the recommended thresholds for convergent validity (AVE ≥ .50; CR ≥ .78 in both models) following purification (Soto-Pérez et al., 2020). Three retained indicators had loadings below .70 (TL5 = .58, SE4 = .68, saE1 = .57; see Section 3.3 for the retention rule and Section 4.5 for sensitivity analyses). In the cross-loadings (Appendix A, Tables A3 and A4), every indicator loaded more strongly on its intended construct than on any other construct in both models, although saE1 in the rival model did so only marginally (.37 on engagement vs. .34 on self-efficacy). Loadings in **Tables 1 and 2** come from PLSsemEngine (factorial inner weighting) and cross-loadings from the supplementary routine (path weighting), so the two can differ slightly (up to .02).

Table 1. Measurement model results — primary model (subjective well-being outcome), n = 104.

Construct	Item	Loading	CR	AVE
Transformational leadership (TL)	TL2	.81	.79	.57
	TL3	.85		
	TL5	.58		
Self-efficacy (SE)	SE1	.76	.80	.58
	SE3	.83		
	SE4	.68		
Intrinsic satisfaction (iJS)	iJS1	.79	.90	.70
	iJS2	.83		
	iJS3	.85		
	iJS4	.88		
Extrinsic satisfaction (eJS)	eJS1	.89	.94	.79
	eJS2	.84		
	eJS3	.92		
	eJS4	.89		
Engagement (E)	saE1	.57	.79	.56
	saE2	.86		

Continuation Table:

Construct	Item	Loading	CR	AVE
	saE3	.79		
	SWB1	.88		
Subjective well-being (SWB)	SWB2	.81	.86	.67
	SWB3	.77		

Note. CR = composite reliability; AVE = average variance extracted. Estimates from PLSsemEngine (factorial inner weighting).

Table 2. Measurement model results — rival model (flow outcome), n = 104.

Construct	Item	Loading	CR	AVE
	TL2	.82		
Transformational leadership (TL)	TL3	.85	.79	.57
	TL5	.57		
	SE1	.76		
Self-efficacy (SE)	SE3	.84	.80	.57
	SE4	.67		
	iJS1	.79		
Intrinsic satisfaction (iJS)	iJS2	.83	.90	.70
	iJS3	.86		
	iJS4	.86		
	eJS1	.89		
Extrinsic satisfaction (eJS)	eJS2	.85	.94	.79
	eJS3	.92		
	eJS4	.89		
	saE1	.37		
Engagement (E)	saE2	.89	.78	.56
	saE3	.88		
Flow	Fl1	.79	.86	.75
	Fl4	.94		

Note. CR = composite reliability; AVE = average variance extracted.

Table 2 presents the equivalent results for the rival (flow) model, estimated on the same 104 observations. Shared constructs differ slightly between the two models because their composite scores are re-estimated with a different outcome in the model.

4.2. Discriminant validity

Tables 3a and 3b report the heterotrait–monotrait (HTMT) ratios for both

models; HTMT2 values showed the same pattern and are not reported. All point estimates fell below the conventional .85 threshold; the highest was for engagement and flow (HTMT = .78). Bootstrap 95% confidence intervals (5,000 resamples; Appendix A, Table A2) exceeded .85 for two pairs: engagement–flow (95% CI [.57, 1.04]; 34% of bootstrap estimates above .85) and transformational leadership–self-efficacy (95% CI [.43, .90]; about 6% above .85); the upper bound for intrinsic satisfaction–engagement was .85. The engagement–flow estimate is the more consequential, because engagement is a mediator and flow the outcome in the rival model; discriminant validity between the two should therefore be regarded as unresolved rather than established. Part of the overlap is a matter of item content: the retained flow item Fl4 ("I can say that I enjoy doing my work") and the engagement item saE2 ("I enjoy doing my work") are almost identical in wording (Appendix B). The Fornell–Larcker criterion was satisfied for all constructs in both models (including engagement–flow: square roots of AVE of .75 and .87 vs. a latent-variable correlation of .58), although this criterion is less sensitive than HTMT (Henseler et al., 2015).

Table 3a. Discriminant validity (HTMT) — primary model (SWB), n = 104.

	TL	SE	iJS	eJS	E
SE	.63				
iJS	.44	.23			
eJS	.44	.32	.60		
E	.42	.39	.56	.32	
SWB	.50	.40	.43	.49	.43

Table 3b. Discriminant validity (HTMT) — rival model (Flow), n = 104.

	TL	SE	iJS	eJS	E
SE	.63				
iJS	.44	.23			
eJS	.44	.32	.60		
E	.42	.39	.56	.32	
Flow	.40	.33	.66	.35	.78

4.3. Structural model

Figures 1a and 1b present the estimated path models for the primary and rival outcomes, and **Table 4** reports the full structural results, including bootstrap confidence intervals and effect sizes.

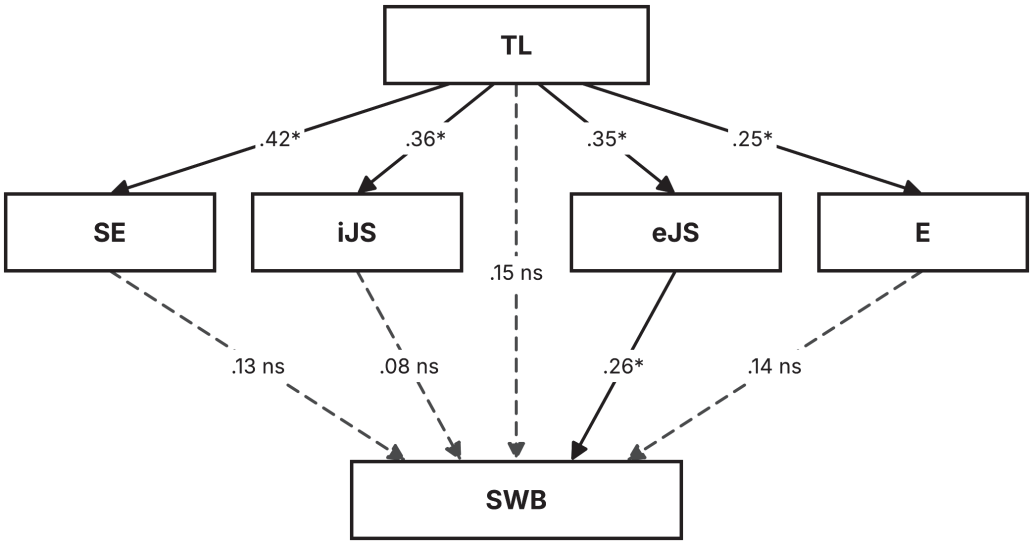


Figure 1a. Path model for the primary structural model (subjective well-being outcome).

*Note. Solid lines denote significant paths (95% CI excludes zero); dashed lines denote non-significant paths. * 95% CI excludes zero. The vertical dashed arrow is the direct effect of TL on the outcome.*

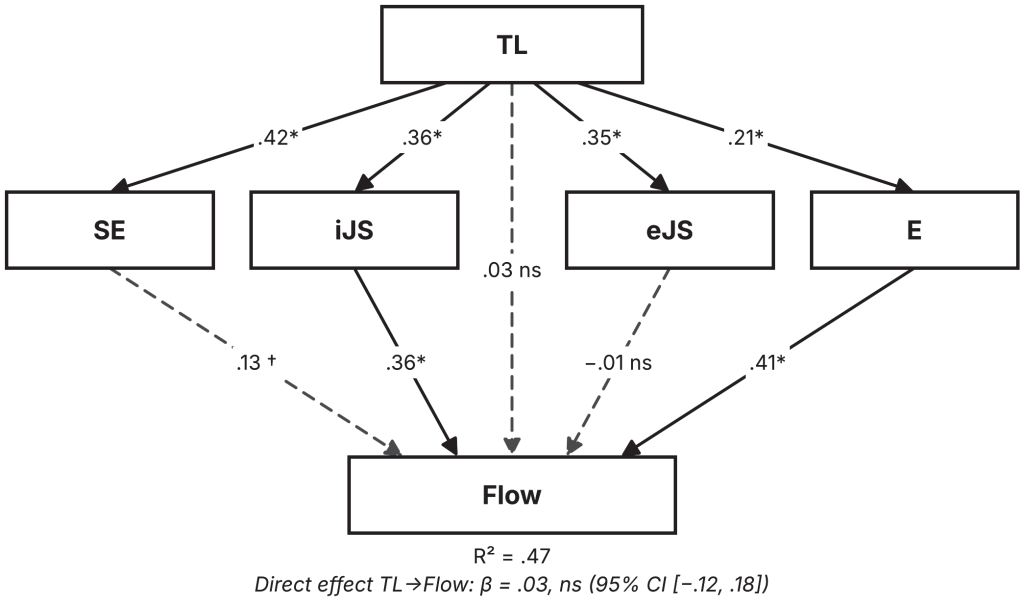


Figure 1b. Path model for the rival structural model (flow outcome).

*Note. Solid lines denote significant paths (95% CI excludes zero); dashed lines denote non-significant paths. * 95% CI excludes zero. † marginal (95% CI lower bound at .00). The vertical dashed arrow is the direct effect of TL on the outcome.*

Table 4. Structural model results — comparison of primary and rival models.

Path	Primary model (→ SWB)β [95% CI]	f²	Rival model (→ Flow)β [95% CI]	f²
TL → SE	.42 [.27, .59]*	.21	.42 [.28, .59]*	.22
TL → iJS	.36 [.24, .51]*	.15	.36 [.23, .51]*	.15
TL → eJS	.35 [.19, .52]*	.14	.35 [.20, .52]*	.14
TL → E	.25 [.08, .44]*	.07	.21 [.03, .41]*	.05

Continuation Table:

Path	Primary model (→ SWB)β [95% CI]	f²	Rival model (→ Flow)β [95% CI]	f²
SE → Y	.13 [−.06, .34] ns	.02	.13 [.00, .27]†	.02
iJS → Y	.08 [−.15, .29] ns	.01	.36 [.18, .53]*	.14
eJS → Y	.26 [.08, .46]*	.06	−.01 [−.19, .18] ns	.00
E → Y	.14 [−.11, .34] ns	.02	.41 [.21, .57]*	.25
T L → Y (direct)	.15 [−.07, .35] ns	.02	.03 [−.12, .18] ns	.00
R^2 (Y)	.28		.47	

*Note. Y = SWB in the primary model, Flow in the rival model. * 95% CI excludes zero. † CI lower bound at .00 (marginal). Bootstrapping based on 5,000 resamples; confidence intervals from PLSsemEngine.*

In the primary model, transformational leadership was positively associated with all four resources (β = .25 to .42; all 95% CIs excluded zero), supporting H1–H4, whereas its direct association with subjective well-being was not significant (β = .15, 95% CI [−.07, .35]). Of the four resources, only extrinsic satisfaction was significantly associated with subjective well-being (β = .26, 95% CI [.08, .46]; H7 supported); self-efficacy, intrinsic satisfaction and engagement were not (H5, H6 and H8 not supported; **Table 4**). The model explained 28% of the variance in subjective well-being (R^2 = .28).

In the rival model, transformational leadership was likewise positively associated with all four resources (β = .21 to .42), and its direct association with flow was not significant (β = .03, 95% CI [−.12, .18]). Engagement (β = .41, 95% CI [.21, .57]) and intrinsic satisfaction (β = .36, 95% CI [.18, .53]) were significantly associated with flow, whereas extrinsic satisfaction was not (β = −.01, 95% CI [−.19, .18]); self-efficacy was borderline (β = .13; 95% CI [.00, .27] in PLSsemEngine and [−.01, .27] in the supplementary bootstrap) and is not interpreted as significant. The model explained 47% of the variance in flow (R^2 = .47).

Table 5 decomposes the association of transformational leadership with each outcome into direct, specific indirect and total components. For subjective well-being, the total (β = .367, 95% CI [.207, .522]) and total indirect associations (β = .211, 95% CI [.088, .369]) were significant, but the only significant specific indirect association was that through extrinsic satisfaction (β = .095, 95% CI [.028, .190]; VAF = 25.8%), an indirect-only mediation in the typology of Zhao et al. (2010); H9 was therefore supported only through extrinsic satisfaction. For flow, the total (β = .286, 95% CI [.145, .436]) and total indirect associations (β = .259, 95% CI [.147, .401]) were significant, with indirect-only mediation through intrinsic satisfaction (β = .127, 95% CI [.062, .216]; VAF = 44.6%) and engagement (β = .084, 95% CI [.010, .169]; VAF = 29.5%), but not through self-efficacy or extrinsic satisfaction; H9r was therefore supported only through intrinsic satisfaction and engagement. Mediation is thus supported mediator by mediator, not for the four resources as a set. Although the direct associations were not significant, their confidence intervals are wide (e.g. [−.067, .358] for subjective well-being), so partial mediation, or a modest direct association, cannot be excluded with n = 104. Within the subjective well-being model, the specific indirect associations did not differ significantly from one another (all 95% CIs for pairwise differences included zero).

Table 5. Direct, indirect and total associations of transformational leadership with subjective well-being and flow (n = 104).

Effect	Subjective well-being β [95% CI]	Mediation type (VAF)	Flow β [95% CI]	Mediation type (VAF)
TL → Y (direct)	.155 [−.067, .358]		.027 [−.120, .182]	
TL → SE → Y	.055 [−.031, .170]	No mediation	.052 [−.003, .127]	No mediation
TL → iJS → Y	.027 [−.066, .113]	No mediation	.127 [.062, .216]*	Indirect-only (44.6%)
TL → eJS → Y	.095 [.028, .190]*	Indirect-only (25.8%)	−.005 [−.081, .066]	No mediation
TL → E → Y	.035 [−.038, .103]	No mediation	.084 [.010, .169]*	Indirect-only (29.5%)
Total indirect	.211 [.088, .369]*	(57.6%)	.259 [.147, .401]*	(90.5%)
Total effect	.367 [.207, .522]*		.286 [.145, .436]*	

*Note. Y = subjective well-being (left) or flow (right). Estimates from the supplementary paired bootstrap routine (path weighting; 5,000 resamples; percentile 95% CIs); * 95% CI excludes zero. Mediation type follows Zhao et al. (2010): indirect-only = significant indirect and non-significant direct association; no mediation = neither significant. VAF = indirect effect / total effect, reported descriptively and only because the total effect was significant.*

Because both models were estimated on the same 104 managers, their coefficients can be compared directly (**Table 6**). The flow model explained more variance (R^2 = .467) than the subjective well-being model (R^2 = .283), but the difference (−.184, 95% CI [−.331, −.003]) only just excluded zero and is driven mainly by engagement and intrinsic satisfaction, the constructs conceptually closest to flow; it should not be read as evidence that flow is better explained than well-being. Homologous coefficients differed between outcomes for engagement (difference = −.266, 95% CI [−.509, −.030]), intrinsic satisfaction (−.283, 95% CI [−.514, −.073]) and extrinsic satisfaction (.282, 95% CI [.093, .502]), but not for self-efficacy or for the direct association of transformational leadership. Two of the six contrasts between pairs of mediators excluded zero (**Table 7**): engagement versus extrinsic satisfaction (−.548, 95% CI [−.867, −.268]) and intrinsic versus extrinsic satisfaction (−.564, 95% CI [−.967, −.215]); that is, relative to extrinsic satisfaction, both engagement and intrinsic satisfaction were more strongly associated with flow than with subjective well-being. These contrasts were not specified in advance, were not corrected for multiple comparisons and rest on standardised coefficients of constructs with different reliability; they are exploratory. Within the subjective well-being model, the extrinsic-satisfaction path was not significantly larger than the intrinsic-satisfaction path (difference = .193, 95% CI [−.161, .585]).

Table 6. Paired comparison of the primary and rival models estimated on the same sample (n = 104).

Path	Subjective well-being β	Flow β	Difference (SWB − Flow) [95% CI]
TL → Y (direct)	.155	.027	.128 [−.119, .368]
SE → Y	.131	.124	.007 [−.218, .240]
iJS → Y	.074	.357	−.283 [−.514, −.073]*
eJS → Y	.267	−.015	.282 [.093, .502]*
E → Y	.138	.405	−.266 [−.509, −.030]*

Continuation Table:

Path	Subjective well-being β	Flow β	Difference (SWB − Flow) [95% CI]
R^2 (Y)	.283	.467	−.184 [−.331, −.003]*

*Note. Y = subjective well-being or flow. β from the supplementary routine (path weighting), which reproduces the PLSsemEngine estimates to within .02; differences and percentile 95% CIs from 5,000 paired bootstrap resamples; * 95% CI excludes zero.*

Table 7. Contrasts between mediators in the difference between outcomes (n = 104).

Contrast	Difference-in-differences [95% CI]
E vs. SE	−.274 [−.657, .083]
E vs. iJS	.016 [−.372, .414]
E vs. eJS	−.548 [−.867, −.268]*
SE vs. iJS	.290 [−.001, .589]
SE vs. eJS	−.275 [−.620, .039]
iJS vs. eJS	−.564 [−.967, −.215]*

*Note. Each contrast is [β(SWB) − β(Flow)] for the first mediator minus the same quantity for the second; negative values indicate that the first mediator is relatively more associated with flow. Only contrasts among the four mediators are shown; * 95% CI excludes zero. Exploratory; no correction for multiple comparisons.*

4.4. Predictive relevance and model fit

PLSpredict (ten-fold cross-validation) returned Q^2predict values close to zero for all indicators in both models (range −.022 to .029). Values were negative for several indicators, including SWB2, and small and positive for the other outcome indicators (SWB1 = .007, SWB3 = .001, Fl1 = .010, Fl4 = .029), so the PLS predictions did not meaningfully outperform the naïve benchmark of the training-sample mean (Shmueli et al., 2019). Against the linear-model (LM) benchmark, RMSE was practically identical for the subjective well-being indicators (differences of .003 or less) and only marginally lower for PLS for the flow indicators (Fl1 = .666 vs. .669; Fl4 = .535 vs. .543), so the path models offered no clear predictive advantage over a regression-type benchmark. Global fit indices were SRMR = .10, dULS = 1.84 and dG = 3.33 for the primary model and SRMR = .10, dULS = 1.87 and dG = 3.30 for the rival model, above the strict SRMR threshold of .08 proposed by Henseler et al. (2016). The contribution is therefore explanatory and exploratory rather than predictive: the R^2 values (.28 and .47) describe in-sample explained variance, and the value of the model comparison, if any, lies in the pattern of mediating pathways it suggests.

4.5. Sensitivity analyses and common method bias

Removing, one at a time, the retained indicators with loadings below .70 (TL5, SE4 and saE1; TL5 corresponds in content to contingent reward) left the pattern of significant paths unchanged for extrinsic satisfaction → subjective well-being, engagement → flow and intrinsic satisfaction → flow (Table A5). The self-efficacy → flow path, borderline in the main model, was significant when SE4 or saE1 was removed and not when TL5 was removed (lower bound .000). The engagement → subjective well-being path remained non-significant, although its lower confidence bound approached zero when saE1 was removed (95% CI [−.009, .364]); all other paths directed at subjective well-being remained non-significant in every specification.

Two further checks addressed the overlap between engagement and flow (Table A6). Without saE2, the engagement indicator closest in wording to Fl4, the engagement → flow and intrinsic satisfaction → flow paths remained significant, although the engagement–flow HTMT became unstable (.882, 95% CI [.554, 2.059]) because engagement was then measured by two weakly correlated indicators. With flow measured by Fl1 alone, both paths also remained significant and the R^2 of flow fell to .208, below that of subjective well-being (.283): the higher R^2 of flow in the main model therefore depends on the near-identical Fl4 and saE2 items. HTMT requires at least two indicators per construct and is therefore undefined for a single-indicator flow construct; descriptively, the mean absolute correlation between the engagement indicators and Fl1 was .26 (95% CI [.16, .39]). This specification is a sensitivity analysis only and does not establish discriminant validity between engagement and flow. Removing saE1 from the rival model left engagement and intrinsic satisfaction significant and made the self-efficacy → flow path significant ($\beta = .140$, 95% CI [.011, .280]).

Full collinearity VIFs were all below 3.3 (Section 3.3). The marker-variable adjustment ($r(M) = .22$; Table A7) was more demanding. After adjustment, the correlation between transformational leadership and self-efficacy remained significant (adjusted $r = .232$, $p = .02$), but those of transformational leadership with intrinsic satisfaction (.135, $p = .18$), extrinsic satisfaction (.135, $p = .17$), engagement (.045, $p = .65$), subjective well-being (.164, $p = .10$) and flow (.059, $p = .55$) did not. Among the relations involving the outcomes, the adjusted correlations of extrinsic satisfaction with subjective well-being (.248, $p = .01$), of engagement with flow (.358, $p < .001$) and of intrinsic satisfaction with flow (.375, $p < .001$) remained significant, whereas the others did not. Because the proxy is itself a correlation among substantive constructs it may over-correct; nonetheless, the associations of transformational leadership with intrinsic satisfaction, extrinsic satisfaction and engagement — all self-rated by the same managers — are not robust to this adjustment and should be interpreted with caution. Finally, among the 61 managers whose engagement was also rated by their supervisor, self-rated and supervisor-rated engagement (first three items) were positively correlated ($r = .43$, 95% Fisher CI [.19, .61], $p < .001$), which offers partial evidence of convergence across sources but does not extend to the other constructs.

5. Discussion

Transformational leadership was positively associated with all four of the leader's own resources (supporting H1–H4), as a gain-spiral account would lead one to expect. These associations need to be read with caution, however: managers rated their own leadership and resources at a single time point, and the associations with intrinsic satisfaction, extrinsic satisfaction and engagement did not survive a conservative marker-variable adjustment (Section 4.5). The direct association of transformational leadership with subjective well-being was not distinguishable from zero, and only extrinsic satisfaction carried a significant indirect association with it (supporting H7 and, for that mediator only, H9). That extrinsic but not intrinsic satisfaction relates to subjective well-being reproduces the pattern reported by Soto-Pérez and Briseño (2026) on the same underlying sample ($n = 136$ in that study); this is a within-sample consistency check rather than an independent validation, and the contrast between the two facets should be treated cautiously, because the two paths did not differ significantly from each other (Section 4.3; cf. Gelman & Stern, 2006). The non-significant association of self-efficacy with subjective well-being ($\beta = .13$) is

best read as inconclusive, given the limited power of n = 104 to detect a path of this size.

This pattern, in which only one of several parallel resources shows a detectable indirect association with subjective well-being, echoes Saruhashi et al. (2025), who found that, of three resources mediating transformational leadership's effect on employees' subjective well-being, only organisational recognition and decision-making discretion carried a significant indirect effect, whereas workplace intrinsic meaning did not. Differentiated rather than uniform mediation may therefore be common when several psychological resources are modelled in parallel — a pattern easily missed in single-mediator designs.

In the rival model, engagement and intrinsic satisfaction, rather than extrinsic satisfaction, carried the indirect associations with flow, and two of the six contrasts between mediators were consistent with a dissociation between the outcomes: relative to extrinsic satisfaction, engagement and intrinsic satisfaction were more strongly associated with flow than with subjective well-being. This dissociation was not predicted a priori, rests on contrasts that were not corrected for multiplicity, and is offered as a hypothesis for future research rather than as a confirmed mechanism. It may also partly reflect measurement: the engagement–flow HTMT was .78 with a confidence interval extending above .85, flow was measured with two indicators capturing only its enjoyment/time-distortion facet, and the higher variance explained in flow (R^2 = .47 vs. .28) is driven chiefly by the constructs conceptually closest to flow (when flow was measured with Fl1 alone, R^2 fell to .21; Table A6). One speculative account draws on the distinction between the evaluative and experiential components of well-being (Diener et al., 1999; Kahneman & Riis, 2005): subjective well-being, as operationalised here, captures a retrospective judgement about one's life as a whole, whereas flow captures a momentary state of task absorption. Extrinsic satisfaction, a relatively stable appraisal of one's rewards, may be more naturally suited to feeding a global evaluative judgement; engagement (vigour and absorption) and intrinsic satisfaction (enjoyment of the task itself) may be more naturally suited to feeding a momentary experiential state. This interpretation has not been tested against alternatives such as measurement overlap and is consistent with, rather than supported by, the present data.

The positive association between transformational leadership and self-efficacy (H1) deserves particular comment, because self-efficacy has frequently been modelled as an antecedent of transformational leadership (e.g., Fitzgerald & Schutte, 2010). A cross-sectional design cannot establish direction: in a bivariate path between two composites, the standardised coefficient equals their correlation whichever variable is specified as the predictor. The association is consistent with enacting transformational leadership functioning as a mastery experience (Bandura, 1997) that strengthens the leader's self-efficacy — the gain-spiral counterpart of the loss spiral documented by Byrne et al. (2014) — but it is equally consistent with the conventional direction or with reciprocal relationships, and shared self-evaluation tendencies may contribute, since each manager rated both constructs. Testing a gain spiral requires longitudinal designs.

5.1. Theoretical contributions

This study contributes to the leadership literature in three ways, each tempered by its cross-sectional design. First, it extends research on the leader's own psychological states (Geibel et al., 2022; Mencl et al., 2016; Nielsen, 2013; Wittmers et al., 2024, 2025) and the Job Demands–Resources view of transformational

leadership as a resource-generating mechanism (Berger et al., 2019; Katou et al., 2022) by examining which of four parallel resources carry the association, rather than treating leaders' engagement or well-being as single outcomes of leadership behaviour. Second, by estimating a rival model with a conceptually distinct outcome on the same respondents, it provides exploratory evidence that the same leader-related resources are not uniformly associated with every form of positive experience, cautioning against treating "leader flourishing" as a single undifferentiated construct. Third, methodologically, it illustrates the value of comparing a rival outcome, rather than a rival predictor, to probe the specificity of a resource-based mechanism.

5.2. Practical implications

For organisations, the findings are tentative: the design is cross-sectional and self-reported, so it cannot show that developing leaders will change their own well-being or engagement. Within that limit, the findings suggest that investment in transformational leadership development may be associated with returns not only in follower outcomes but in leaders' own psychological functioning, provided the desired outcome is specified — consistent with a JD-R view of transformational leadership as a resource that can be deliberately cultivated rather than treated solely as an individual trait (De Clercq & Belausteguigoitia, 2017). For human resource management, extrinsic satisfaction — satisfaction with the rewards, recognition and conditions the organisation provides — was the only resource with a detectable indirect association with managers' general well-being, which makes reward and recognition systems a candidate lever for well-being programmes aimed at middle managers. Engagement and the intrinsic meaningfulness of the leadership role were associated with flow, pointing, for programmes that aim to foster absorption and enjoyment at work, towards job design and role enrichment for managers. Because the flow evidence is preliminary, such measures should be piloted and evaluated, ideally longitudinally, before being adopted at scale, and leaders' own well-being and engagement may usefully be included among the indicators used to evaluate leadership-development programmes.

5.3. Limitations and future research

Several limitations qualify these conclusions. First, all constructs were self-reported by the same managers at one time point, and transformational leadership was self-assessed rather than rated by followers, so common method variance and self-enhancement tendencies cannot be ruled out (Podsakoff et al., 2003). Full collinearity VIFs were low, but a conservative marker-variable adjustment rendered the associations of transformational leadership with three of the four resources non-significant, and only engagement was also rated by a second source; future work should use multi-source or multi-wave designs, following Geibel et al. (2022) and Widianto and Wilderom (2023). Second, the cross-sectional design precludes causal inference and cannot test a gain spiral; the association with self-efficacy (H1), in particular, is numerically identical whichever direction is specified, so longitudinal or experimental data are needed. Third, flow was measured with two indicators covering only its enjoyment/time-distortion facet, one of which (Fl4) is almost identical in wording to an engagement item (saE2); the engagement–flow HTMT (.78, 95% CI [.57, 1.04]) leaves discriminant validity unresolved, and the flow findings, including the contrast between the two outcomes, are therefore preliminary. Fourth, the analytic sample excludes 32 managers surveyed before the flow items were added, who reported higher scores on all 20 shared indicators (significantly so on nine), and with n = 104 the study had limited power to detect paths smaller than

about .25. Fifth, the sample was drawn from a single industry and region (footwear manufacturing, Bajío, Mexico), no demographic or organisational controls were collected, and the instruments were translated into Spanish without a reported back-translation, so replication is needed before generalising the pattern observed here (Briseño et al., 2024). Sixth, Q^2predict values close to zero and an SRMR of .10 in both models limit the findings to explanation rather than prediction. Seventh, three retained indicators had loadings below .70 (TL5, SE4, saE1), and TL5 ("I recognise my work team when they do a good job") corresponds in content to contingent reward, which the Transformational Leadership Inventory classifies as a transactional behaviour (Podsakoff et al., 1990); the main conclusions held when each indicator was removed in turn, but the self-efficacy → flow path was sensitive to these choices. In addition, TL5, saE2 and saE3 were close to the scale ceiling, with 65% to 77% of responses at the maximum (Table A1), which may attenuate correlations. Finally, the extrinsic-satisfaction-to-well-being association had previously been estimated on the same managers (Soto-Pérez & Briseño, 2026), and the contrasts between outcomes were exploratory, uncorrected for multiple comparisons and based on standardised coefficients of constructs with different reliability.

6. Conclusion

Transformational leadership appears to be positively associated not only with how leaders affect others, but with leaders' own psychological resources — self-efficacy, job satisfaction, and engagement — in a pattern consistent with, though not a test of, a resource gain spiral. These associations should be read with caution: those with intrinsic satisfaction, extrinsic satisfaction and engagement were not robust to a conservative marker-variable adjustment, although this proxy may over-correct and does not show that they are entirely attributable to method bias. Which of these resources is related to a tangible benefit for the leader appears to depend on the kind of benefit considered: in this exploratory sample of 104 managers, extrinsic satisfaction was the only resource with a detectable indirect association with general well-being, whereas engagement and intrinsic satisfaction were associated with momentary flow, a finding that is preliminary given the two-indicator flow measure and the unresolved overlap between engagement and flow. Future research should test this possible dissociation directly, ideally with longitudinal and multi-source designs, better flow measures, and samples that are not restricted to a single industry and region.

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administered to adult middle managers and their direct supervisors, with no sensitive personal data and no foreseeable risk to participants. By analogy with the Mexican regulation of health research with human participants, which classifies studies limited to questionnaires, without intentional intervention in participants' physiological, psychological or social variables, as research without risk (Reglamento de la Ley General de Salud en Materia de Investigación para la Salud, Art. 17, section I), and given that the authors' institution has no mandatory protocol requiring ethical review for studies of this type, the study was not submitted to an institutional ethics committee. Responses were linked through email addresses solely to match manager and supervisor responses; the addresses were then deleted, and the analysed dataset contains no identifying information.

Informed consent statement: Before data collection, all participants were informed, in the body of the email that accompanied the questionnaire, of the academic purpose of the study, the confidential treatment of their responses and the matching of manager and supervisor responses. Participation was voluntary and informed consent was implied by completing the questionnaire. Managers and supervisors were matched by email address, which was deleted immediately after matching; responses were therefore pseudonymised during matching and anonymous thereafter, and no personal identifiers were retained in the analysed dataset; no participant was compensated or coerced to participate.

Data availability statement: The anonymised data supporting the findings of this study are not publicly available due to participant and organisational confidentiality but are available from the corresponding author (msoto@up.edu.mx) upon reasonable request.

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Appendix A. Supplementary measurement and sensitivity results

Table A1 reports item-level descriptive statistics for the indicators of the final models (n = 104). Table A2 reports HTMT ratios with bootstrap 95% confidence intervals, and Tables A3 and A4 report the cross-loadings of the primary and rival models. Table A5 reports the sensitivity analyses in which each retained indicator with a loading below .70 was removed in turn. Table A6 reports robustness checks of the rival model to the overlap between engagement and flow, and Table A7 the correlations used for the marker-variable adjustment. Appendix B (Table B1) gives the item wording.

Table A1. Item-level descriptive statistics (n = 104)

Item	Min	Max	M	SD	Skewness	Excess kurtosis
TL2	3	5	4.38	0.60	−.38	−.69
TL3	3	5	4.21	0.69	−.30	−.90
TL5	2	5	4.60	0.62	−1.50	2.26
SE1	3	5	4.39	0.53	.03	−1.15
SE3	3	5	4.31	0.61	−.27	−.64
SE4	3	5	4.36	0.57	−.20	−.73
iJS1	1	5	3.71	0.94	−.45	−.04
iJS2	1	5	4.06	0.93	−.76	.04
iJS3	1	5	4.15	0.92	−1.13	.93
iJS4	1	5	4.15	0.89	−1.30	2.04
eJS1	1	5	3.64	1.16	−.60	−.41
eJS2	1	5	4.12	1.09	−1.30	1.02
eJS3	1	5	3.93	1.05	−.81	.06
eJS4	1	5	3.84	1.09	−.67	−.33
saE1	3	5	4.33	0.63	−.38	−.68
saE2	3	5	4.68	0.51	−1.23	.41
saE3	3	5	4.76	0.45	−1.53	1.13
SWB1	2	5	3.88	0.78	−.04	−.83
SWB2	3	5	4.32	0.71	−.54	−.89
SWB3	2	5	4.20	0.73	−.63	.11
Fl1	2	5	4.27	0.74	−.76	.16
Fl4	2	5	4.43	0.69	−.99	.39

Note. All indicators were rated on a five-point scale (1 = strongly disagree, 5 = strongly agree). Skewness and excess kurtosis are population moments computed on the 104 analysed cases.

Table A2. HTMT ratios with bootstrap 95% confidence intervals (n = 104)

Pair	HTMT	95% CI	Proportion of bootstrap estimates > .85
TL – SE	.629	[.430, .896]	.055
TL – iJS	.442	[.279, .678]	.001

Continuation Table:

Pair	HTMT	95% CI	Proportion of bootstrap estimates > .85
TL – eJS	.444	[.274, .654]	.000
TL – E	.417	[.256, .762]	.009
TL – SWB	.503	[.316, .740]	.003
TL – Flow	.403	[.227, .657]	.001
SE – iJS	.228	[.134, .510]	.000
SE – eJS	.321	[.182, .570]	.000
SE – E	.391	[.263, .712]	.003
SE – SWB	.397	[.208, .677]	.000
SE – Flow	.326	[.190, .595]	.000
iJS – eJS	.605	[.429, .756]	.001
iJS – E	.560	[.313, .848]	.024
iJS – SWB	.426	[.261, .600]	.000
iJS – Flow	.663	[.498, .836]	.017
eJS – E	.317	[.178, .570]	.000
eJS – SWB	.495	[.349, .639]	.000
eJS – Flow	.349	[.210, .564]	.000
E – SWB	.429	[.227, .662]	.000
E – Flow	.779	[.570, 1.041]	.344

Note. 5,000 bootstrap resamples; percentile intervals. Pairs not involving SWB or Flow are identical in the primary and rival models. Pairs with SWB come from the primary model and pairs with Flow from the rival model.

Table A3. Cross-loadings — primary model (subjective well-being outcome), n = 104

Item	TL	SE	iJS	eJS	E	SWB
TL2	.806	.334	.330	.293	.190	.295
TL3	.853	.332	.320	.360	.212	.334
TL5	.578	.293	.121	.087	.168	.173
SE1	.351	.755	.052	.149	.099	.212
SE3	.372	.834	.255	.365	.252	.316
SE4	.178	.682	.088	.027	.161	.156
iJS1	.191	.095	.788	.239	.279	.202
iJS2	.270	.093	.826	.531	.296	.256
iJS3	.284	.134	.853	.483	.491	.346
iJS4	.406	.262	.879	.546	.309	.362
eJS1	.342	.228	.461	.894	.181	.338

Continuation Table:

Item	TL	SE	iJS	eJS	E	SWB
eJS2	.256	.219	.495	.840	.276	.355
eJS3	.290	.235	.502	.925	.232	.460
eJS4	.366	.308	.531	.889	.148	.376
saE1	.244	.340	.191	.202	.569	.126
saE2	.222	.078	.409	.224	.855	.266
saE3	.093	.137	.303	.086	.794	.269
SWB1	.340	.379	.341	.454	.287	.883
SWB2	.311	.160	.217	.323	.255	.814
SWB3	.237	.193	.333	.245	.179	.760

Note. Correlations between each indicator and the composite score of each construct, computed with the supplementary routine (path weighting); the highest value in each row corresponds to the intended construct.

Table A4. Cross-loadings — rival model (flow outcome), n = 104

Item	TL	SE	iJS	eJS	E	Flow
TL2	.819	.339	.325	.295	.184	.265
TL3	.846	.333	.312	.359	.164	.231
TL5	.567	.293	.123	.081	.118	.125
SE1	.352	.757	.047	.150	.091	.166
SE3	.372	.839	.249	.366	.174	.284
SE4	.174	.668	.085	.025	.114	.105
iJS1	.191	.094	.790	.239	.268	.330
iJS2	.272	.093	.832	.531	.303	.410
iJS3	.285	.136	.865	.483	.497	.578
iJS4	.408	.265	.863	.549	.294	.473
eJS1	.343	.233	.456	.891	.150	.205
eJS2	.258	.224	.489	.851	.256	.339
eJS3	.289	.239	.501	.920	.209	.297
eJS4	.367	.311	.526	.887	.103	.258
saE1	.240	.340	.191	.202	.367	.092
saE2	.222	.079	.416	.229	.886	.509
saE3	.095	.137	.309	.086	.878	.547
Fl1	.181	.100	.350	.106	.398	.806
Fl4	.297	.319	.570	.379	.579	.928

Note. Correlations between each indicator and the composite score of each construct, computed with the supplementary routine (path weighting). saE1 loads .367 on engagement and .340 on self-efficacy.

Table A5. Sensitivity of path coefficients to the removal of retained indicators with loadings below .70 (n = 104)

Path	Main model	Without TL5	Without SE4	Without saE1
TL → SWB	.155 [−.067, .358]	.151 [−.085, .361]	.154 [−.072, .362]	.158 [−.074, .363]
E → SWB	.138 [−.109, .344]	.147 [−.083, .354]	.141 [−.098, .351]	.184 [−.009, .364]
SE → SWB	.131 [−.078, .348]	.140 [−.070, .356]	.128 [−.088, .353]	.142 [−.067, .356]
iJS → SWB	.074 [−.168, .298]	.073 [−.169, .303]	.077 [−.178, .310]	.048 [−.195, .284]
eJS → SWB	.267 [.079, .470]*	.259 [.075, .472]*	.260 [.071, .469]*	.276 [.093, .484]*
TL → Flow	.027 [−.120, .182]	.031 [−.123, .189]	.018 [−.130, .172]	.031 [−.119, .184]
E → Flow	.405 [.206, .565]*	.408 [.215, .563]*	.404 [.203, .562]*	.431 [.248, .580]*
SE → Flow	.124 [−.008, .266]	.127 [.000, .268]	.145 [.007, .292]*	.140 [.011, .280]*
iJS → Flow	.357 [.183, .534]*	.355 [.184, .522]*	.362 [.185, .531]*	.343 [.172, .506]*
eJS → Flow	−.015 [−.207, .175]	−.017 [−.205, .176]	−.026 [−.211, .162]	−.007 [−.189, .181]

Note. β [95% percentile CI] from the supplementary routine (2,000 bootstrap resamples for the specifications without an indicator; 5,000 for the main model); * 95% CI excludes zero. Removing an indicator from a three-indicator block leaves two indicators, so these results should be read with caution.

Table A6. Robustness of the rival model to the overlap between engagement and flow (n = 104)

Specification	R^2 (flow)	HTMT (E, Flow) [95% CI]	E → Flow β [95% CI]	iJS → Flow β [95% CI]	SE → Flow β [95% CI]
Main rival model	.467	.779 [.570, 1.041]	.405 [.206, .565]*	.357 [.183, .534]*	.124 [−.008, .266]
Without saE2	.452	.882 [.554, 2.059]	.370 [.138, .543]*	.392 [.218, .565]*	.094 [−.039, .249]
Flow measured by Fl1 only	.208	—	.286 [.056, .473]*	.279 [.059, .512]*	.007 [−.184, .212]
Without saE1	.488	.796 [.598, .982]	.431 [.248, .580]*	.343 [.172, .506]*	.140 [.011, .280]*

Note. β and percentile 95% CI from the supplementary routine (path weighting; 5,000 bootstrap resamples for the main rival model, as in Tables A2 and A5, and 2,000 for the other specifications); * 95% CI excludes zero. The direct path TL → Flow and the path eJS → Flow were non-significant in all specifications. When engagement is measured by two indicators (without saE1 or saE2), the HTMT estimate is unstable and should be read with caution. HTMT is not defined for a single-indicator construct and is therefore not reported for Fl1 only; the mean absolute correlation between the engagement indicators and Fl1 was .26 [.16, .39] (not an HTMT), and this row is a sensitivity analysis that does not establish discriminant validity.

Table A7. Correlations among the unweighted composites used for the marker-variable adjustment (n = 104)

	TL	SE	iJS	eJS	E	SWB	Flow
TL	1						
SE	.400	1					
iJS	.323	.159	1				
eJS	.324	.234	.535	1			
E	.253	.242	.400	.232	1		
SWB	.346	.279	.345	.412	.288	1	

Continuation Table:

	TL	**SE**	**iJS**	**eJS**	**E**	**SWB**	**Flow**
Flow	.264	.218	.511	.277	.499	.448	1

Note. Composites are means of the standardised indicators; their correlations therefore differ from the latent-variable correlations used for the Fornell–Larcker criterion (Section 4.2). The second-smallest absolute correlation (SE–Flow, r = .218) was used as the marker-variable proxy r(M) (Lindell & Whitney, 2001).

Appendix B. Item wording

Table B1 lists the items of the final measurement models. The Spanish wording is that administered to respondents (obvious typographical errors in the administered text were corrected here); the English translation is provided for the reader's convenience. All items were rated on a five-point scale (1 = strongly disagree, 5 = strongly agree).

Table B1. Items of the final measurement models: Spanish wording and English translation

Construct (source)	Item	Spanish wording (administered)	English translation
Transformational leadership (Rafferty & Griffin, 2004)	TL2	Animo a las personas a ver un ambiente de cambio como un ambiente de oportunidades	I encourage people to see a changing environment as an environment of opportunities
	TL3	Fomento que las personas vean los problemas desde distintos y nuevos ángulos	I encourage people to look at problems from different and new angles
	TL5	Reconozco a mi equipo de trabajo cuando hacen un buen trabajo	I recognise my work team when they do a good job
Self-efficacy (Su & Cheng, 2019)	SE1	Ante un problema en el trabajo, generalmente encuentro una solución	When facing a problem at work, I usually find a solution
	SE3	Puedo enfrentar los problemas con calma porque creo que tengo la habilidad para resolverlos	I can face problems calmly because I believe I have the ability to solve them
	SE4	Cuando me meto en problemas, normalmente obtengo la solución	When I get into trouble, I usually find the solution
Intrinsic job satisfaction (Yang & Hwang, 2014)	iJS1	Considero que desarrollo todo mi potencial en el trabajo que tengo actualmente	I feel that I develop my full potential in my current job
	iJS2	Mi trabajo me ofrece oportunidades para seguir desarrollando las habilidades en las que destaco	My job offers me opportunities to keep developing the skills in which I excel
	iJS3	Mi trabajo me ofrece oportunidades para hacer las cosas que me gustan	My job offers me opportunities to do the things I like
	iJS4	Me siento satisfecho con mi trabajo	I am satisfied with my job
Extrinsic job satisfaction (Yang & Hwang, 2014)	eJS1	Mi empresa promueve al personal de manera justa	My company promotes staff fairly
	eJS2	Mi empresa ofrece buenas prestaciones	My company offers good benefits
	eJS3	Mi empresa constantemente busca mejorar las condiciones de trabajo	My company constantly seeks to improve working conditions
	eJS4	Mi empresa ofrece buenas oportunidades de crecimiento	My company offers good opportunities for growth
Engagement, self-rated (Hamari et al., 2016)	saE1	Suelo estar concentrado en mi trabajo durante mi jornada laboral	I am usually focused on my work during my working day
	saE2	Disfruto realizar mi trabajo	I enjoy doing my work
	saE3	Considero interesante mi trabajo	I find my work interesting
Subjective well-being (Bhatti et al., 2020)	SWB1	En la mayoría de los aspectos, mi vida se acerca a mi ideal	In most ways, my life is close to my ideal

Continuation Table:

Construct (source)	Item	Spanish wording (administered)	English translation
	SWB2	Estoy satisfecho con mi vida	I am satisfied with my life
	SWB3	Hasta ahora, he conseguido las cosas importantes que quiero en la vida	So far, I have gotten the important things I want in life
Flow (Tuncer, 2021)	Fl1	Durante el trabajo, generalmente siento que el tiempo pasa rápidamente	During work, I usually feel that time passes quickly
	Fl4	Puedo decir que disfruto realizar mi trabajo	I can say that I enjoy doing my work

Note. Items eliminated during purification (TL1, TL4, TL6, SE2, saE4, saE5, SWB4, Fl2, Fl3) are not listed. The English translations of TL2, TL3, TL5, Fl1 and Fl4 follow the wording used for the same items in related work with this dataset; the other translations were prepared for this appendix with AI assistance (see AI usage statement).