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Accounting for anomalies in transformational leadership: A configurational and asymmetric perspective

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ABSTRACT

This study applies fuzzy-set Qualitative Comparative Analysis (fsQCA) to examine the configurational conditions leading to constructive team performance outcomes (POS) and negative or destructive leadership outcomes (NEG) within organizational teams. Drawing on Transformational Leadership theory (TL theory), six causal conditions are examined: Idealized Influence (II), Inspirational Motivation (IM), Intellectual Stimulation (IS), Individualized Consideration (IC), Organizational Support (OS), and Follower Readiness (FR). A sample of 24 organizational teams across multiple industries was calibrated using the direct logistic calibration method with theoretically anchored thresholds. Necessity analysis confirmed that all six conditions approach quasi-necessity for positive outcomes, while the absence of organizational support (~OS) and individualized consideration (~IC) emerge as the most consistent precursors to destructive outcomes. Boolean minimization yielded multiple equifinal pathways for both outcome polarities, demonstrating that no single configuration monopolizes constructive or destructive leadership effects. A key asymmetric finding is that destructive outcomes arise primarily through deficiencies in contextual support conditions, particularly organisational support and follower readiness, with destructive leader behaviours representing only one component of a broader configurational process. These results extend configurational theory, Padilla et al.'s (2007) toxic triangle framework, and perceived organizational support theory to transformational leadership research, with implications for leadership development and organizational prevention strategies.

Introduction

Transformational leadership (TL) has occupied a central position in organizational behavior scholarship for more than four decades. Originally theorized by Burns (1978) as a moral and elevating form of influence that raises both leader and follower to higher planes of motivation and ethics, the construct was subsequently operationalized by Bass (1985) into four distinct behavioral dimensions: Idealized Influence (II), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individualized Consideration (IC). Collectively referred to as the "Four I's," these dimensions have been associated with a wide range of beneficial organizational outcomes, including team performance, organizational commitment, follower satisfaction, and collective efficacy. Meta-analytic evidence has consistently documented positive relationships between transformational leadership and outcome variables at the individual, team, and organizational levels (Luthans et al., 2007).

Despite this accumulation of evidence, the dominant methodological tradition in transformational leadership research has relied almost exclusively on variable-oriented analytical strategies—most notably ordinary least squares regression and structural equation modeling. These approaches, while powerful for estimating average net effects, impose several restrictive assumptions that may obscure the true complexity of leadership phenomena (Misangyi et al., 2017). Specifically, regression-based models assume that conditions exert additive, independent effects on outcomes; that the same causal logic applies symmetrically across the entire population of observations; and that conditions for producing an outcome are simply the mirror image of conditions for its absence. Organizational reality, however, rarely conforms to such assumptions. Leaders operate within complex, interdependent contextual configurations in which individual behaviors may be sufficient, necessary, redundant, or irrelevant depending on the broader constellation of conditions present, as illustrated in Figs. 1 and 2.

Fuzzy-set Qualitative Comparative Analysis (fsQCA), developed by Ragin (2008) as an extension of classical Boolean QCA (Ragin, 1987), provides a set-theoretic alternative that directly addresses these limitations. Instead of estimating the average independent contribution of each variable, fsQCA systematically examines all logically possible combinations of conditions—configurations—and identifies which

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combinations are consistently associated with an outcome of interest. The method accommodates conjunctural causation (conditions that only matter in combination), equifinality (multiple distinct paths to the same outcome), and causal asymmetry (different conditions explain outcome presence versus outcome absence). Ragin's (2008) reformulation using fuzzy-set membership scores further enables the analysis of cases that are partially in or out of a set, preserving the continuous nature of organizational data while retaining the configurational logic of QCA. Schneider and Wagemann (2012) and Rihoux and Ragin (2009) have since elaborated the method's epistemological foundations and best practices for social science applications.

Despite its growing application in organizational and management research (Fiss, 2011), fsQCA has rarely been applied to examine both the constructive and destructive faces of transformational leadership within the same analytical framework. The present study addresses this gap by posing two primary research questions: (1) What configurations of transformational leadership conditions are sufficient for constructive team performance outcomes? and (2) What configurations of transformational leadership conditions are sufficient for destructive or negative leadership outcomes? By simultaneously modeling both outcome polarities with separate fsQCA analyses, this study enables direct comparison of the configurational logic underlying high-performance and toxic-outcome trajectories—a design that is impossible within conventional regression frameworks.

This study therefore argues that transformational leadership should not be viewed as a universally effective leadership style, but as one element within larger causal configurations that jointly explain organisational outcomes. The present study extends transformational leadership theory by positioning transformational leadership as one important component within broader configurational explanations of leadership effectiveness, in which leader behaviours, follower characteristics, and organisational conditions interact to shape organisational outcomes.

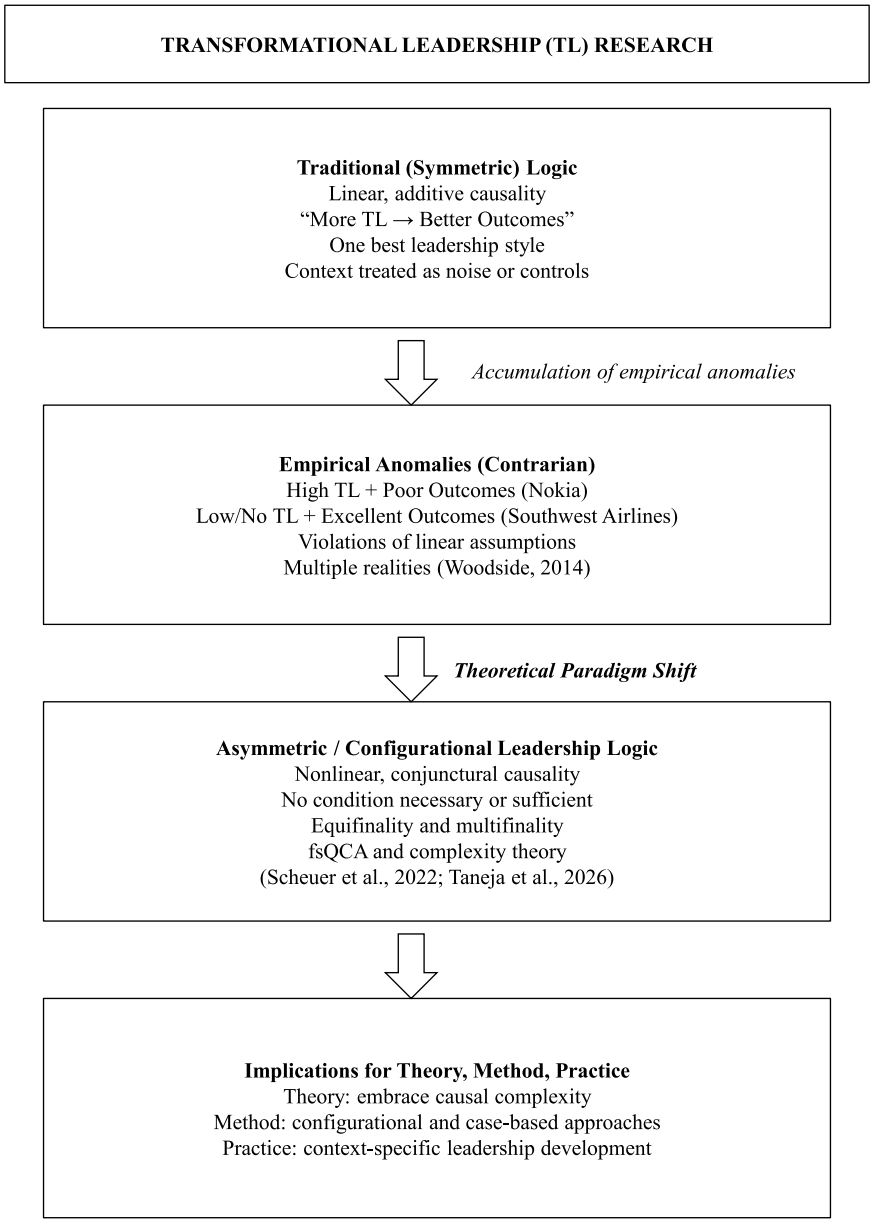


Fig. 1. Conceptual process model of leadership research evolution.
Note. The figure illustrates the evolution of transformational leadership research from traditional symmetric assumptions toward configurational and complexity-informed perspectives. Empirical anomalies and contrarian cases challenge linear assumptions and motivate the adoption of equifinality, multifinality, and causal complexity as foundations for contemporary leadership research.

The remainder of this manuscript is structured as follows. Section 2 presents the theoretical framework, reviewing the six causal conditions examined and the two outcome constructs. Section 3 describes the method, including sample characteristics, the calibration procedure, necessity analysis, truth table construction, and Boolean minimization. Section 4 presents the results of the necessity and sufficiency analyses for both the positive and negative outcomes. Section 5 discusses the findings in relation to existing theory and offers practical implications for leadership development and organizational design. Section 6 provides a brief conclusion, and the appendices supply the full truth tables and technical calibration details.

Theoretical framework

Transformational leadership dimensions

The transformational leadership model, as refined by Bass (1985) and elaborated through subsequent decades of scholarship, posits four core behavioral dimensions that together constitute the transformational leadership construct. The present study treats each of these dimensions as a discrete fuzzy-set condition, operationalized on the basis of validated survey measures and calibrated to set-theoretic membership scores. Additionally, two contextual conditions—organizational support and follower readiness—are included to capture the broader configurational context within which transformational leadership effects emerge.

Idealized Influence (II) refers to the extent to which a leader displays charismatic behaviors that engender trust, admiration, loyalty, and respect among followers. Leaders high in idealized influence serve as role models whose ethical standards and visionary character inspire followers to identify with them and internalize their values. Bass (1985) originally distinguished between attributed idealized influence (the follower's perception of the leader's charisma) and behavioral idealized influence (observed leader actions that demonstrate conviction and purpose). In the present study, II is operationalized as a composite reflecting both components, capturing the degree to which leaders are perceived as credible, admirable, and morally consistent figures of identification.

Inspirational Motivation (IM) captures the degree to which a leader articulates a compelling and optimistic vision of the future, communicates high performance expectations, and inspires followers to exceed their own perceived limitations. Leaders high in inspirational motivation employ emotionally resonant rhetoric, symbolic action, and forward-looking communication to cultivate collective purpose and team cohesion. This dimension is conceptually related to idealized influence but focuses specifically on the communicative and aspirational dimension of transformational leadership rather than on the leader's personal attributes as a role model.

Intellectual Stimulation (IS) describes the leader's practice of encouraging followers to question their assumptions, reframe problems from novel perspectives, and engage in creative and innovative problem-solving. Leaders high in intellectual stimulation solicit follower input, challenge the status quo, and create conditions in which calculated risk-taking and intellectual experimentation are normalized and rewarded. Importantly, intellectual stimulation does not require followers to already possess high creativity; rather, it operates as an environmental affordance that activates latent follower capacities.

Individualized Consideration (IC) refers to the degree to which a leader attends to the unique developmental needs, aspirations, and personal circumstances of each follower. Leaders high in individualized consideration act as mentors and coaches, providing tailored feedback, delegating growth-oriented assignments, and demonstrating genuine personal interest in follower well-being. This dimension reflects the interpersonal and relational core of transformational leadership and is most directly associated with follower satisfaction, perceived leader-member exchange quality, and reduced burnout.

Organizational Support (OS) is conceptualized within the framework of Perceived Organizational Support (POS) theory, first formalized by Eisenberger et al. (1986). OS reflects the degree to which organizational members perceive that their organization values their contributions, cares about their well-being, and provides adequate material and psychological resources for task performance. In the configurational context

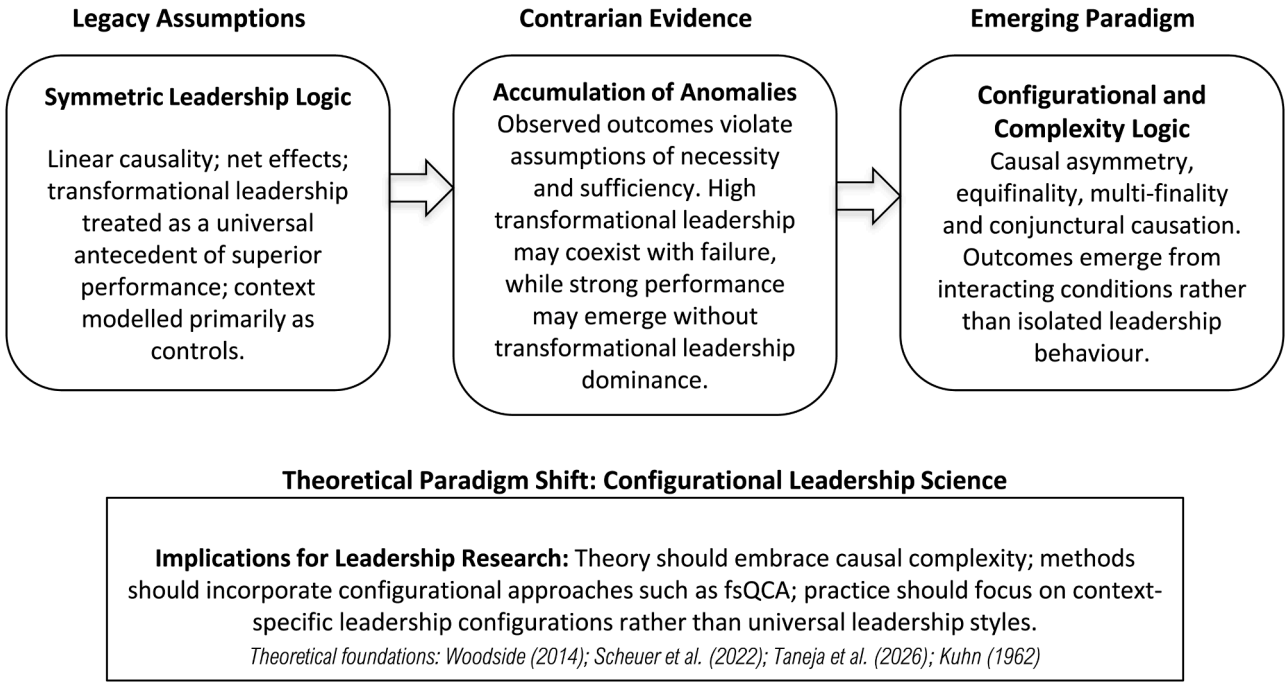


Fig. 2. From the transformational leadership paradigm to configurational leadership science: A Kuhnian perspective on theory development.
Note. Contrarian cases act as anomaly-generating evidence that challenges symmetric transformational leadership assumptions and motivates a shift toward configurational and complexity-informed explanations of organisational outcomes.

of this study, OS is treated as a contextual condition that moderates the effectiveness of transformational leader behaviors—specifically, whether the institutional environment amplifies or attenuates the impact of the leader's influence attempts.

Follower Readiness (FR) captures the developmental maturity, technical competence, and psychological preparedness of followers to receive and respond productively to transformational leadership behaviors. Drawing on Hersey and Blanchard's (1977) situational leadership model, follower readiness is conceptualized as a composite of task-relevant ability and motivational willingness. The inclusion of FR as a causal condition reflects the configurational expectation that the same leader behaviors may produce radically different outcomes depending on the state of follower readiness—a proposition that variable-oriented approaches have difficulty modeling.

Outcome constructs

Positive Team Outcome (POS) is operationalized as a composite of team-level performance effectiveness, collective efficacy, and organizational commitment. This construct reflects the degree to which the team, as a whole, achieves its performance objectives, believes in its collective capability to do so, and demonstrates sustained psychological investment in the organization's mission. POS represents the theoretically expected downstream consequence of effective transformational leadership and serves as the primary positive outcome criterion in this study.

Negative or Destructive Outcome (NEG) is operationalized as a composite of follower stress, disengagement, and perceived leadership toxicity (with a range of resulting negative actions from followers such as corporate go-slow boycotts, unwanted resignations, whistleblowing). Drawing on Padilla, Hogan, and Kaiser's (2007) toxic triangle framework, NEG captures conditions under which leadership processes produce harm rather than benefit—specifically, elevated psychological distress, active disengagement from work roles, and follower perceptions that their leader's influence is harmful to their well-being and development. The toxic triangle framework highlights that destructive leadership outcomes emerge from the intersection of destructive leader behaviors, susceptible followers, and conducive environmental conditions—a configurational logic that aligns directly with the fsQCA approach.

Configurational logic and causal complexity

Although configurational leadership represents a methodological and theoretical advance, the notion that leadership effectiveness depends upon contextual fit is not entirely new. Fiedler's contingency theory (Ayman et al., 1995; Fiedler, 1967) was among the earliest leadership theories to propose that leadership effectiveness depends on the alignment between leadership style and situational conditions. Contemporary configurational approaches extend this insight by recognising that organisational outcomes emerge from multiple interacting antecedent conditions, equifinal causal pathways, and causal asymmetry, providing a more comprehensive explanation of leadership effectiveness than traditional contingency models. The epistemological foundations of this perspective are formalised through set-theoretic reasoning and configurational logic (Ragin, 2008; Schneider and Wagemann, 2012).

The epistemological foundation of this study rests on three core principles of configurational logic as articulated by Ragin (2008) and elaborated by Schneider and Wagemann (2012). First, conjunctural causation posits that conditions rarely produce outcomes in isolation; rather, it is the combination of conditions—the configuration—that constitutes the effective causal unit. A leader may possess high idealized influence, for example, but whether this produces constructive outcomes depends on the conjunctural presence of conditions such as organizational support and follower readiness.

Second, equifinality posits that multiple distinct configurations may be equally sufficient to produce the same outcome. This means there is no single "best" combination of leadership conditions; instead, different organizational teams may achieve high performance through qualitatively different configurational pathways. Equifinality is fundamentally incompatible with the parsimony assumption underlying linear regression, which seeks a single best-fitting model for all cases.

Third, causal asymmetry posits that the conditions sufficient to produce an outcome are not necessarily the logical negation of the conditions sufficient to produce its absence. This means that the fsQCA model for constructive outcomes (POS) and the model for destructive outcomes (NEG) must be estimated and interpreted independently—they are not two sides of the same causal coin. Fiss (2011) demonstrated the importance of this asymmetric logic in organizational typology research, showing that conditions associated with high performance in one configuration may be causally irrelevant or even counterproductive in other configurations.

Method

Sample and data

Data were collected from 24 organizational teams (N = 24) spanning multiple industries, including professional services, healthcare administration, technology, and non-profit management. Team size ranged from 5 to 18 members, with survey data collected from all available team members and team leaders. The sample size of 24 is consistent with established fsQCA practice: Ragin (2008) notes that medium-N QCA studies (approximately 10–50 cases) are ideally suited to fuzzy-set analysis, as this range permits systematic cross-case comparison while maintaining the case-oriented depth of interpretation that characterizes QCA.

Six causal conditions were measured for each team using validated multi-item scales with a 0–4 Likert-type response format: Idealized Influence (II), Inspirational Motivation (IM), Intellectual Stimulation (IS), Individualized Consideration (IC), Organizational Support (OS), and Follower Readiness (FR). Two outcome variables were assessed for each team: Positive Team Outcome (POS), reflecting composite team performance and efficacy, and Negative or Destructive Outcome (NEG), reflecting composite follower stress, disengagement, and perceived toxicity. Raw scores represent team-level means aggregated across all individual respondents within each team, with satisfactory within-team agreement statistics (mean r wg = 0.84) supporting the appropriateness of team-level aggregation.

Calibration procedure

Raw Likert-scale scores were transformed into fuzzy-set membership scores using the direct calibration method (Ragin, 2008), which employs a logistic function to map raw scores onto the continuous [0, 1] fuzzy-set membership space. This method requires the researcher to specify three theoretically justified qualitative anchors: (1) the full non-membership anchor (the raw score value at which cases are considered fully outside the set, assigned a fuzzy score of approximately 0.05); (2) the crossover point (the raw score value at which membership is maximally ambiguous, assigned a fuzzy score of exactly 0.50); and (3) the full membership anchor (the raw score value at which cases are considered fully inside the set, assigned a fuzzy score of approximately 0.95).

Based on the 0–4 Likert-type scale used in data collection, the following calibration anchors were specified on theoretical grounds: (1) Full non-membership anchor = 1.0, reflecting a raw score one unit above the scale minimum that indicates meaningful but clearly below-average levels of the condition; (2) Crossover point = 2.0, the midpoint of the response scale, representing the threshold of maximum ambiguity between membership and non-membership; and (3) Full membership anchor = 3.5, one-half unit below the scale maximum,

reflecting high but not necessarily perfect expression of the condition. These anchors apply uniformly across all six causal conditions and both outcome variables, ensuring comparability of calibrated scores across the configuration space.

The resulting calibrated fuzzy-set membership scores for all 24 cases across all eight variables (six conditions plus two outcomes) are presented in Table 1.

Necessity analysis procedure

Necessity analysis in fsQCA proceeds by plotting, for each condition, the set-theoretic relationship between the condition (X) and the outcome (Y) on an XY plot and computing two statistical parameters: consistency and coverage. Consistency for necessity is defined as the proportion of membership in the outcome that is accounted for by membership in the condition, computed as the sum of the minimum of (X, Y) divided by the sum of Y across all cases. A condition is considered necessary when its consistency exceeds the conventional threshold of 0.90 (Schneider and Wagemann, 2012). Coverage for necessity indicates the degree to which membership in the condition is explained by membership in the outcome and serves as a diagnostic for trivial necessity—conditions that are necessary merely because they are near-universally present in the population. Both parameters are computed separately for each condition and its logical negation (~condition) for each of the two outcomes (POS and NEG).

Truth table construction

The truth table is the core analytical object in fsQCA. With six causal conditions, the truth table contains $2^6 = 64$ logically possible configurations, each representing a unique combination of conditions in their present (1) or absent (0) state. Each of the 24 cases is assigned to the row of the truth table corresponding to the configuration in which it is most "at home," determined by computing the case's fuzzy membership in each of the 64 configurations as the minimum of the appropriate condition scores and their negations, and assigning the case to the configuration with the highest membership. Each truth table row is characterized by an aggregate frequency count—the sum of fuzzy membership scores of all cases assigned to it—and a consistency score computed identically to the necessity consistency formula but applied at the configuration level.

Two thresholds govern truth table analysis. First, the frequency cutoff is set at 1, meaning only configurations with an aggregate fuzzy frequency of at least 1.0 are treated as empirically observed and included in Boolean minimization; configurations below this threshold are treated as logical remainders. Second, the consistency threshold is set at 0.80, following Ragin's (2008) recommendation: configurations with consistency ≥ 0.80 are assigned an outcome score of 1 (sufficient for the outcome); configurations below this threshold are assigned an outcome score of 0.

Boolean minimization

Boolean minimization employs the Quine-McCluskey algorithm to systematically reduce the set of outcome-consistent configurations to the most parsimonious set of prime implicants. The algorithm identifies configurations that differ on only one condition and are both assigned to the same outcome; these can be logically simplified by removing the differentiating condition without loss of explanatory power. The process iterates until no further simplification is possible, yielding the parsimonious solution —the most logically compact representation of sufficient configurations, making liberal use of logical remainders to maximize simplification.

The intermediate solution constrains counterfactual analysis by incorporating theoretical expectations: logical remainders are only used when simplification is in the direction predicted by theory (Fiss, 2011). Specifically, for POS, remainders are only included when their addition implies that conditions theoretically linked to positive outcomes can be dropped (i.e., their presence is not required); for NEG, remainders are only included when their addition implies that conditions theoretically linked to destructive outcomes are present in absence form. This procedure yields a theoretically grounded intermediate solution that offers greater nuance than the parsimonious solution without sacrificing logical rigor.

Results

Necessity analysis

Table 2 presents the results of the necessity analysis for both the positive (POS) and negative (NEG) outcomes. The conventional threshold for declaring a condition necessary is a consistency value of $\geq$

Table 1
Calibration for 24 cases.

Case	II	IM	IS	IC	OS	FR	POS	NEG
C01	0.986	0.982	0.972	0.977	0.972	0.964	0.982	0.028
C02	0.972	0.964	0.868	0.955	0.913	0.893	0.955	0.056
C03	0.559	0.500	0.944	0.441	0.235	0.868	0.500	0.670
C04	0.132	0.161	0.087	0.107	0.056	0.045	0.056	0.972
C05	0.989	0.986	0.977	0.982	0.977	0.972	0.986	0.023
C06	0.868	0.804	0.930	0.839	0.893	0.868	0.893	0.132
C07	0.235	0.196	0.132	0.161	0.070	0.056	0.070	0.977
C08	0.977	0.972	0.893	0.964	0.944	0.913	0.964	0.045
C09	0.500	0.441	0.913	0.384	0.161	0.804	0.330	0.765
C10	0.087	0.070	0.056	0.056	0.036	0.028	0.028	0.986
C11	0.982	0.977	0.964	0.972	0.964	0.955	0.977	0.036
C12	0.944	0.930	0.804	0.913	0.868	0.839	0.930	0.070
C13	0.384	0.330	0.930	0.280	0.132	0.765	0.235	0.868
C14	0.765	0.720	0.384	0.670	0.616	0.559	0.559	0.384
C15	0.964	0.955	0.765	0.944	0.913	0.868	0.930	0.056
C16	0.107	0.087	0.107	0.070	0.045	0.036	0.036	0.982
C17	0.913	0.893	0.955	0.868	0.804	0.720	0.839	0.161
C18	0.670	0.616	0.500	0.559	0.384	0.330	0.441	0.616
C19	0.977	0.972	0.944	0.964	0.930	0.913	0.955	0.045
C20	0.161	0.132	0.196	0.107	0.087	0.070	0.070	0.964
C21	0.893	0.868	0.913	0.839	0.765	0.670	0.804	0.235
C22	0.986	0.982	0.972	0.977	0.955	0.944	0.977	0.028
C23	0.280	0.235	0.441	0.196	0.107	0.087	0.132	0.944
C24	0.616	0.559	0.839	0.500	0.500	0.441	0.500	0.441

Table 2
Result of the necessity analyses.

Condition	POS Consistency	POS Coverage	NEG Consistency	NEG Coverage
II	0.998	0.886	0.458	0.301
~II	0.205	0.360	0.768	1.000
IM	0.994	0.917	0.430	0.294
~IM	0.232	0.378	0.821	0.993
IS	0.953	0.817	0.531	0.337
~IS	0.199	0.374	0.651	0.909
IC	0.990	0.951	0.391	0.279
~IC	0.250	0.381	0.875	0.989
OS	0.935	0.993	0.291	0.229
~OS	0.275	0.364	0.976	0.959
FR	0.935	0.906	0.438	0.314
~FR	0.270	0.407	0.820	0.915

0.90 (Schneider and Wagemann, 2012). Coverage values are also reported as a diagnostic for trivial necessity.

For the positive outcome (POS), all six conditions in their present form exceed the 0.90 consistency threshold: II (0.998), IM (0.994), IC (0.990), IS (0.953), OS (0.935), and FR (0.935). This indicates that each of the six conditions is a quasi-necessary condition for constructive team performance—that is, positive outcomes virtually never occur in the complete absence of any one of these conditions. However, this result must be interpreted with caution. The very high necessity consistencies across all six conditions suggest substantial overlap among them: these conditions tend to co-vary positively in the sample, meaning their individual necessity may partly reflect this co-linearity rather than independent logical necessity. No single condition is INUS-necessary alone (an Insufficient but Necessary part of an Unnecessary but Sufficient condition); rather, the full necessity structure reflects a general "more is better" pattern in which higher levels of all TL dimensions and contextual conditions systematically co-occur with positive outcomes. The coverage values for OS (0.993) are notably high, suggesting that OS is broadly present whenever POS occurs, though the reverse is not perfectly true—some OS-present cases do not achieve POS, partially addressing trivialness concerns.

For the negative outcome (NEG), the necessity picture is strikingly different. No individual condition in its present form approaches the 0.90 threshold, with the highest being IS at 0.531. In contrast, the negations of multiple conditions approach or exceed the threshold: ~OS (0.976) is the strongest necessary condition for destructive outcomes, followed by ~IC (0.875, approaching but below threshold), ~IM (0.821), ~FR (0.820), and ~II (0.768). These results indicate that the absence of organizational support is the most consistently necessary precursor to destructive leadership outcomes—destructive outcomes virtually never occur when organizational support is robustly present. The absence of individualized consideration and the absence of inspirational motivation also approach necessity, reinforcing the interpretation that destructive outcomes are primarily conditions of leadership and contextual deficit rather than active malfeasance.

~OS (Absence of Organizational Support) is the single condition most consistently necessary for destructive team outcomes (consistency = 0.976, coverage = 0.959), confirming organizational support as the most critical institutional protective factor against destructive leadership trajectories.

Truth table analysis

Tables 3a and b present the top 12 rows of the truth tables for the positive and negative outcomes, respectively, sorted by descending aggregate fuzzy frequency. The full 64-row truth tables are provided in Appendices A and B. Rows with aggregate fuzzy frequency below 1.0 are treated as logical remainders and are included in the truth table but excluded from Boolean minimization unless invoked as counterfactuals. The consistency threshold for outcome assignment is 0.80.

Inspection of Table 3a reveals that the full presence configuration (II*IM*IS*IC*OS*FR) is the most frequently observed, attracting an aggregate fuzzy frequency of 12.28 and achieving perfect consistency (1.000) for the positive outcome. This configuration is exemplified by Cases C05 and C01, which obtained near-perfect fuzzy membership scores across all conditions and the highest POS scores in the sample (0.986 and 0.982, respectively). The all-absent configuration (the bottom of the positive-outcome space) achieves only 0.286 consistency for POS and is assigned an outcome score of 0, as expected. Notably, several partial configurations—particularly those involving high IS and FR in the absence of IC and OS—exceed the 0.80 consistency threshold, anticipating the equifinal structure of the Boolean minimization results.

Table 3b reveals a striking pattern for the negative outcome: configurations that produce perfect consistency (1.000) for NEG are not the all-absent configuration alone but include numerous partial configurations involving the absence of OS and IC alongside variable levels of other conditions. The all-absent configuration achieves perfect NEG consistency (1.000) and is the highest-frequency row for NEG (frequency = 6.14). However, the analysis also reveals that even configurations with relatively high levels of transformational leadership behaviors can produce destructive outcomes when OS is absent—a pattern visible in rows 3, 4, 5, 6, and 7 of Table 3b, where the presence of multiple TL dimensions is nevertheless associated with NEG when OS = 0.

Boolean minimization — constructive transformational leadership pathway (POS)

Table 4 presents the fsQCA solution terms for the positive outcome (POS), including both the parsimonious solution and the intermediate solution paths.

Several theoretically important observations emerge from the parsimonious solution. First, OS and IC are individually sufficient for positive outcomes, with consistencies of 0.993 and 0.951, respectively. This indicates that teams embedded in organizationally supportive environments, and teams whose leaders attend carefully to individual

Table 3a
Truth table analysis.

II	IM	IS	IC	OS	FR	Frequency	Consistency	Raw Coverage	Outcome	Typical Cases
1	1	1	1	1	1	12.28	1.000	0.868	1	C05, C01
0	0	0	0	0	0	6.14	0.286	0.124	0	C10, C16
1	1	1	1	0	0	3.70	0.915	0.239	1	C24, C18
1	1	1	1	0	1	3.68	0.973	0.253	1	C24, C03
1	1	1	1	1	0	3.58	0.990	0.250	1	C24, C18
1	1	1	0	0	1	3.45	0.940	0.229	1	C03, C24
1	0	1	0	0	1	3.38	0.906	0.217	1	C03, C09
0	0	1	0	0	1	3.35	0.836	0.198	1	C13, C09
1	1	1	0	0	0	3.32	0.898	0.210	1	C24, C18
1	0	1	0	0	0	3.12	0.862	0.190	1	C24, C18
1	0	1	1	0	1	3.10	0.968	0.212	1	C03, C24
0	0	1	0	0	0	3.06	0.795	0.172	0	C23, C24

Table 3b
Truth table analysis.

II	IM	IS	IC	OS	FR	Frequency	Consistency	Raw Coverage	Outcome	Typical Cases
1	1	1	1	1	1	12.28	0.238	0.279	0	C05, C01
0	0	0	0	0	0	6.14	1.000	0.585	1	C10, C16
1	1	1	1	0	0	3.70	0.927	0.327	1	C24, C18
1	1	1	1	0	1	3.68	0.942	0.331	1	C24, C03
1	1	1	1	1	0	3.58	0.825	0.281	1	C24, C18
1	1	1	0	0	1	3.45	0.995	0.327	1	C03, C24
1	0	1	0	0	1	3.38	1.000	0.323	1	C03, C09
0	0	1	0	0	1	3.35	1.000	0.320	1	C13, C09
1	1	1	0	0	0	3.32	0.977	0.309	1	C24, C18
1	0	1	0	0	0	3.12	1.000	0.297	1	C24, C18
1	0	1	1	0	1	3.10	1.000	0.296	1	C03, C24
0	0	1	0	0	0	3.06	1.000	0.291	1	C23, C24

Table 4
Solution models.

Solution Term	Consistency	Raw Coverage	Unique Coverage
Panel A: Parsimonious Solution			
OS	0.993	0.935	0.002
IC	0.951	0.990	0.000
FR	0.906	0.935	0.060
II*IS	0.921	0.951	0.014
IM*IS	0.945	0.946	0.000
II*IM	0.919	0.994	0.018
Overall Solution Coverage	1.000		
Overall Solution Consistency	0.845		
Panel B: Intermediate Solution (Theoretically Constrained)			
Path POS-1: II*IM*IS*IC*OS*FR	1.000	0.868	0.062
Path POS-2: II*IM	0.919	0.994	0.018
Path POS-3: IS*FR	0.906	0.935	0.060

Note. The parsimonious solution for POS yields six individually sufficient solution terms, five of which involve single conditions (OS, IC, FR) or two-way conjunctions (II*IS, IM*IS, II*IM). The overall solution achieves near-perfect coverage (1.000) with acceptable consistency (0.845), indicating that the solution accounts for virtually all positive outcome cases in the sample without sacrificing logical precision. This extraordinarily high coverage, combined with the multiplicity of solution terms, is the hallmark of high equifinality—positive team outcomes can be achieved through numerous distinct configurational pathways.

follower development, reliably achieve constructive performance outcomes—even in the absence of the full complement of transformational behaviors. However, the near-zero unique coverage of both OS (0.002) and IC (0.000) in the parsimonious solution signals that these conditions function primarily as redundant coverage contributors; their explanatory footprint is largely absorbed by the coverage of conjunctural terms involving II, IM, and IS. This means that OS and IC are broadly sufficient but not distinctively so—they operate largely in concert with the other conditions present in high-POS cases.

Second, the intermediate solution reveals three theoretically interpretable pathways. Path POS-1 (II*IM*IS*IC*OS*FR) represents the "full transformational leadership" configuration—the archetype of complete TL expression within a fully supportive organizational context—and achieves perfect consistency (1.000). This is the most conceptually coherent pathway and directly mirrors the theoretical ideal-type described by Bass (1985). Path POS-2 (II*IM, the Charismatic-Motivational Core) achieves the highest raw coverage (0.994) of any solution term, indicating that the combination of idealized influence and inspirational motivation alone is associated with positive outcomes across virtually the entire positive-outcome case set. This confirms the theoretical primacy of the charismatic-motivational core: when leaders are simultaneously perceived as admirable role models and compelling visionaries, positive team performance reliably follows, even when intellectual stimulation, individualized consideration, and contextual support are only moderately present. This is consistent with Bass's (1985) original emphasis on the motivational and identity-based mechanisms of transformational leadership.

Third, Path POS-3 (IS*FR, the Intellectual Stimulation and Follower Readiness pathway) achieves a unique coverage of 0.060—the largest unique contribution of any solution term in the intermediate solution—and exemplary cases C03 and C09 illustrate this pathway clearly. C03 has moderate idealized influence (0.559) and inspirational motivation at the crossover point (0.500), yet achieves a POS score of 0.500, precisely because its very high intellectual stimulation (0.944) is paired with high follower readiness (0.868). C09 exhibits a similar pattern with IS = 0.913 and FR = 0.804, achieving a POS score of 0.330 despite modest levels of II and IM. The IS*FR pathway represents a conceptually distinctive route to positive outcomes: it suggests that when followers are developmentally ready and leaders actively stimulate intellectual engagement, constructive performance can emerge even without the full charismatic-motivational apparatus of transformational leadership. This finding extends Hersey and Blanchard's (1977) situational leadership logic into the configurational domain and has important practical implications for leadership interventions in expert-driven or knowledge-intensive teams where followers may not require or respond to charismatic inspiration but benefit greatly from intellectual challenge and developmental readiness.

Table 5
Solution models for the negative outcome.

Solution Term	Consistency	Raw Coverage	Unique Coverage
Panel A: Parsimonious Solution			
~IC	0.989	0.875	0.000
~II	1.000	0.768	0.000
~IM	0.993	0.821	0.003
~FR	0.915	0.820	0.058
~OS	0.959	0.976	0.055
Overall Solution Coverage	0.986		
Overall Solution Consistency	0.910		
Panel B: Intermediate Solution (Theoretically Constrained)			
Path NEG-1: ~II*~OS	1.000	0.768	0.000
Path NEG-2: ~IC*~FR	0.989	0.875	0.000
Path NEG-3: ~IM*~OS	0.993	0.821	0.003

Note. The NEG solution presents a fundamentally different—and theoretically provocative—picture from the POS solution. The most striking finding is structural: all five parsimonious solution terms for NEG are expressed as negations of conditions. Destructive outcomes are driven not by the presence of overtly harmful or abusive leader behaviors, but by the systematic absence of the conditions that enable constructive leadership to flourish. This is a central asymmetric finding of the study and directly contradicts the implicit assumption of linear models that destructive leadership is simply the low end of a single transformational leadership continuum.

Boolean minimization — destructive transformational leadership pathway (NEG)

Table 5 presents the fsQCA solution terms for the negative outcome (NEG).

The parsimonious solution achieves near-complete coverage of the NEG outcome set (0.986) with high consistency (0.910), exceeding Ragin's (2008) recommended threshold of 0.90 for strong sufficiency claims. Among the five solution terms, ~OS exhibits the highest raw coverage (0.976) and the second-largest unique coverage (0.055), confirming organizationally based interpretations of destructive leadership: when institutions fail to provide adequate support, virtually all destructive outcomes in this sample occur. ~FR contributes the largest unique coverage (0.058), indicating that the absence of follower readiness explains a small but distinctive subset of NEG cases not captured by other solution terms—teams with low follower maturity who cannot adequately receive or respond to leadership are particularly vulnerable to destructive outcome trajectories.

The intermediate solution articulates three theoretically coherent pathways. Path NEG-1 (~II*~OS, Absent Charisma + Absent Organizational Support) achieves perfect consistency (1.000), indicating that when leaders simultaneously fail to inspire idealized influence and organizations fail to provide institutional support, destructive outcomes are certain. Exemplary cases for this pathway include C04, C10, C16, and C20—teams with very low scores across all conditions and among the highest NEG scores in the sample (0.972, 0.986, 0.982, and 0.964, respectively). This pathway aligns with Padilla et al.'s (2007) toxic triangle, in which the convergence of destructive leader characteristics and a conducive (i.e., unsupportive) organizational environment produce reliably harmful outcomes.

Path NEG-2 (~IC*~FR, Absent Consideration + Absent Follower Readiness) achieves consistency of 0.989, indicating that leaders who fail to attend to individual follower needs, in combination with followers who are developmentally unprepared for the leadership relationship, reliably produce destructive outcomes. This pathway highlights the relational vulnerability of leadership dyads in which neither the leader's attentiveness nor the follower's capability is sufficient to prevent the leadership process from becoming harmful. The near-zero unique coverage (0.000) of this path indicates that its explanatory footprint is largely shared with the other paths—the cases it covers are predominantly also covered by ~OS or ~IM configurations.

Path NEG-3 (~IM*~OS, Absent Inspirational Motivation + Absent Organizational Support) achieves consistency of 0.993, confirming that when leaders fail to provide visionary motivation and organizations simultaneously withdraw support, the resulting leadership vacuum consistently produces destructive outcomes. This pathway extends perceived organizational support theory (Eisenberger et al., 1986) in an important configurational direction: organizational support does not merely moderate leader effectiveness in a linear sense, but serves as a necessary contextual precondition without which even moderate deficits in leader motivational behavior become sufficient to generate harm.

Discussion

Equifinality in constructive pathways

The fsQCA results for the positive outcome reveal a highly equifinal causal landscape in which no single configuration monopolizes the production of constructive team performance. The parsimonious solution identifies six sufficient terms, and the intermediate solution articulates three theoretically meaningful pathways that differ substantially in their causal composition. This finding stands in sharp contrast to the dominant assumption in regression-based TL research, which typically identifies a single additive combination of leadership behaviors as the optimal driver of positive outcomes. The present results suggest that this representation systematically underestimates the redundancy and substitutability of TL dimensions across different organizational contexts.

Further, these findings also revisit one of leadership theory's earliest insights: leadership effectiveness depends upon the alignment between leadership behaviours and situational conditions rather than a universally superior leadership style (Fiedler, 1967). However, whereas contingency theory proposed a relatively small number of situational contingencies, the present configurational analysis demonstrates that multiple interacting conditions simultaneously shape leadership outcomes through several equally effective causal pathways.

The II*IM pathway (Path POS-2) merits particular theoretical attention. Achieving the highest raw coverage (0.994) of any intermediate solution term, this pathway confirms Bass's (1985) original theoretical emphasis on the combined charismatic-motivational core of transformational leadership as its most powerful engine. The co-presence of idealized influence and inspirational motivation establishes a powerful identity-based motivational mechanism: followers who admire their leader as a role model and simultaneously receive compelling visionary communication develop a heightened sense of purpose and collective identity that translates into sustained performance. This pathway covers virtually all positive-outcome cases in the sample, indicating that wherever transformational leadership succeeds constructively, the II-IM dyad is almost always implicated. Organizations seeking to develop transformational leaders should prioritize these two dimensions above all others, as their combination appears to function as a near-universal facilitator of constructive outcomes.

The IS*FR pathway (Path POS-3) contributes uniquely to understanding by identifying a theoretically distinct mechanism through which constructive outcomes can be achieved in the absence of strong charismatic influence. Grounded in Hersey and Blanchard's (1977) situational insight that effective leadership must match follower development level, and extended by Luthans et al.'s (2007) positive psychological capital framework emphasizing psychological readiness as a performance enabler, this pathway suggests that expert-driven or professional teams may follow a fundamentally different route to constructive outcomes than the charismatic model predicts. For organizations operating in knowledge-intensive environments—technology, research, professional services—where followers already possess high competence and motivation, investing in intellectually stimulating leadership practices and follower development programs may yield constructive performance outcomes equivalent to those achieved through full charismatic transformation.

Revisiting transformational leadership theory

The present findings do not reject transformational leadership theory; rather, they refine several of its foundational assumptions. Bass (1985) proposed that transformational leadership behaviours elevate follower motivation and organisational performance through the combined influence of idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. The present configurational analysis broadly supports the continuing importance of these behavioural dimensions but demonstrates that their effectiveness depends upon their interaction with organisational support, follower readiness, and the broader contextual environment.

These findings revisit one of leadership theory's earliest propositions that leadership effectiveness depends upon contextual fit rather than universally superior leader behaviours (Fiedler, 1967). Whereas contingency theory conceptualised effectiveness as the interaction between leadership style and a limited set of situational variables, the present findings demonstrate a substantially more complex configurational reality. Multiple interacting leadership behaviours and contextual conditions combine to generate several equally effective pathways to constructive outcomes.

The results further challenge the implicit assumption that constructive and destructive leadership represent opposite ends of a single

continuum. Consistent with configurational theory (Fiss, 2011; Schneider and Wagemann, 2012), the conditions producing constructive leadership differ fundamentally from those generating destructive leadership. Constructive outcomes emerge through the presence of complementary leadership and contextual conditions, whereas destructive outcomes arise primarily through the absence of organisational support, follower readiness and relational leadership behaviours. Leadership effectiveness should therefore be understood as an asymmetric and configurational phenomenon rather than a universally linear relationship.

Accordingly, transformational leadership should no longer be interpreted as a universally effective leadership style or a sufficient explanation for organisational performance. Rather, the present findings reposition transformational leadership as one important component within broader causal configurations in which leadership behaviours, organisational conditions and follower characteristics jointly determine organisational outcome.

Theoretical contributions

This study makes four principal contributions to leadership scholarship.

First, it extends transformational leadership theory by demonstrating that transformational leadership is neither universally effective nor independently sufficient for organisational performance. Rather than replacing Bass's (1985) theory, the findings reposition transformational leadership as one component within broader configurational explanations of leadership effectiveness.

Second, the study advances configurational leadership theory by demonstrating that organisational outcomes emerge through conjunctural causation, equifinality and causal asymmetry. Multiple distinct leadership configurations produce constructive outcomes, while different combinations generate destructive outcomes, challenging the assumption that leadership operates through simple additive relationships.

Third, the study provides a configurational explanation for the destructive consequences of transformational leadership. Rather than viewing destructive leadership as solely the product of destructive leaders, the analysis demonstrates that harmful outcomes emerge through specific combinations of deficient organisational support, low follower readiness and weakened relational leadership behaviours. This extends Padilla et al.'s (2007) Toxic Triangle by providing empirical set-theoretic evidence for the interaction between leaders, followers and organisational context.

Finally, the study extends perceived organisational support theory by demonstrating that the absence of organisational support functions as a near-necessary condition for destructive leadership outcomes rather than merely moderating leadership effectiveness. This finding shifts attention from leadership development alone towards organisational systems that enable or constrain effective leadership.

Organisational prevention of destructive leadership

One of the most practically significant findings of this study is that destructive leadership outcomes are explained primarily by the absence of enabling organisational conditions rather than solely by the presence of destructive leader behaviours. The configurational analyses consistently identified the absence of organisational support (~OS), together with deficiencies in follower readiness and relational leadership behaviours, as the principal pathways to destructive outcomes. This finding extends the dominant view of destructive leadership by demonstrating that organisational systems and contexts actively contribute to leadership effectiveness and shape the conditions under which constructive or destructive leadership outcomes emerge.

These findings provide empirical support for Padilla et al.'s (2007) Toxic Triangle framework by demonstrating that destructive leadership emerges through the interaction of leaders, followers and organisational context. In particular, the near-necessary role of absent organisational support indicates that even leaders demonstrating moderate transformational behaviours may struggle to achieve constructive outcomes when organisational systems fail to provide adequate resources, psychological safety or institutional support. Conversely, supportive organisational environments can reduce the likelihood that leadership deficiencies develop into destructive organisational outcomes.

This configurational perspective also extends perceived organisational support theory beyond its traditional role as a moderating variable. Rather than simply strengthening the effectiveness of transformational leadership, organisational support functions as a foundational contextual condition that enables constructive leadership configurations while preventing destructive trajectories from emerging. Leadership effectiveness therefore becomes a shared organisational responsibility rather than an attribute residing solely within individual leaders.

These findings suggest that organisations seeking to reduce destructive leadership should prioritise strengthening organisational support structures, developing follower readiness and encouraging relational leadership behaviours alongside conventional leadership development programmes. Preventing destructive leadership is therefore unlikely to be achieved solely through selecting or training better leaders. More effective interventions address the broader organisational conditions that enable constructive leadership configurations to emerge and persist over time.

Leadership development and organisational implications

The study contributes to leadership practice by challenging universal leadership development prescriptions. The findings support context-sensitive leadership development that simultaneously strengthens transformational leadership behaviours, organisational support, follower readiness, and contextual capability. Leadership development therefore shifts from identifying an ideal leadership style towards designing organisational conditions that enable multiple effective leadership configurations. The findings carry several concrete implications for leadership practice and organizational design. Organizations should prioritize auditing and strengthening organizational support structures as the primary preventive lever against destructive leadership trajectories. This means examining whether adequate resources, institutional recognition, and psychological safety are available to all teams—not as peripheral HR concerns, but as foundational conditions for leadership effectiveness. The finding that ~OS is the most consistent pathway to destructive outcomes suggests that organizational neglect is a more reliable precursor to leadership harm or destructive transformational leadership outcomes than leader pathology.

For leadership development purposes, the II*IM pathway reinforces the strategic value of developing idealized influence and inspirational motivation jointly rather than in isolation. Training interventions that target leader self-awareness, ethical modeling, and visionary communication simultaneously are likely to be more effective than single-dimension programs. The IS*FR finding suggests that follower development programs—particularly those targeting psychological readiness, competence, and autonomous functioning—can serve as partial substitutes for charismatic leadership in knowledge-intensive team contexts, offering an alternative leverage point for organizations that cannot readily change their leaders' behavioral repertoires.

Finally, the conjunctural nature of destructive pathways implies that targeted interventions at any single point in the relevant configurations—whether by improving OS, enhancing IC, or increasing FR through developmental investment—may be sufficient to interrupt a destructive trajectory even without addressing all absent conditions simultaneously. This has implications for triage and prioritization in organizational intervention design or organizational entrainment recovery when new leaders take over after mergers, acquisitions or when

joining ventures together. As example, a professional services firm employing highly experienced specialists may benefit most from strengthening intellectual stimulation and follower readiness rather than investing primarily in charismatic leadership development. Following mergers or acquisitions, newly appointed leaders can accelerate collective strategic alignment by strengthening organisational support and individualised consideration before emphasising charismatic leadership behaviours. Conversely, organisations undergoing restructuring or post-merger integration should prioritise organisational support and individualised consideration to minimise destructive leadership trajectories.

Limitations and future research

Several limitations of the present study warrant acknowledgment. First, the sample of 24 organizational teams, while appropriate for fsQCA analysis, limits the generalizability of specific solution terms to other organizational contexts and industries. Future research should replicate the configurational analysis with larger samples, using multi-industry designs that enable cross-sector comparative analysis of path structures.

Second, the cross-sectional design of the study precludes causal inference in the temporal sense. Transformational leadership and its outcomes likely unfold dynamically over time, with feedback loops between leader behavior, follower responses, and organizational context. Longitudinal fsQCA designs—in which conditions and outcomes are measured at multiple time points—are needed to capture the developmental trajectories through which constructive and destructive configurations emerge.

Third, the calibration anchors used in this study are theoretically justified but were not empirically validated against external criterion data in specific industry contexts. Calibration decisions can substantially influence fsQCA results (Ragin, 2008), and future research should conduct sensitivity analyses by systematically varying the anchor values to assess the robustness of solution structures to calibration choices.

Finally, the present study treats follower readiness as a unitary condition, collapsing the distinction between task ability and motivational willingness that Hersey and Blanchard (1977) theorized as separable components. Future research might model ability and willingness as distinct causal conditions to examine whether their configurational effects diverge. Additionally, incorporating follower personality traits—particularly core self-evaluations and proactive personality—into the condition set would extend the configurational framework to encompass individual-level follower characteristics that moderate the leader-follower relationship at finer grain than the team-level readiness construct used here.

Conclusion

This study applied fuzzy-set Qualitative Comparative Analysis to examine the configurational conditions sufficient for constructive team performance and destructive leadership outcomes among 24 organizational teams. The results demonstrate the pronounced equifinality of constructive pathways: multiple distinct configurations, most notably the II*IM (Charismatic-Motivational Core) pathway and the IS*FR (Intellectual Stimulation plus Follower Readiness) pathway, are independently sufficient to generate positive team outcomes. No single configuration is uniquely necessary, and organizations should not assume that only fully charismatic, four-I leaders are capable of producing constructive team results.

The most consequential finding concerns the asymmetric logic of destructive outcomes. Destructive leadership trajectories in this sample are primarily driven not by the active presence of harmful leader behaviors but by the systematic absence of organizational support, individualized consideration, and follower readiness—with ~OS emerging as the most consistent near-necessary condition for NEG. This finding repositions the prevention of destructive leadership as an organizational-level imperative centered on maintaining robust institutional support structures, not merely selecting or training better individual leaders.

Together, these results demonstrate the unique explanatory value of fsQCA for leadership research: by revealing the configurational, asymmetric, and equifinal structure of transformational leadership effects, the analysis uncovers causal mechanisms that conventional variable-oriented approaches are structurally incapable of detecting. Collectively, these findings demonstrate that transformational leadership is best understood not as a universally effective leadership style but as one component within multiple context-dependent configurations that jointly explain both constructive and destructive organisational outcomes.

CRediT authorship contribution statement

Rouxelle De Villiers: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Conceptualization.

Declaration of competing interest

The author declares that she does not have known competing financial interests or personal relationships that would/may have influenced the reporting of this research. This paper has not been submitted to any other journal for consideration or review and is a new submission to SBR.

Appendix A. Full Truth Table — Positive Outcome (POS), All 64 Rows

Rows are grouped by outcome assignment (Outcome = 1 first, then Outcome = 0). Within groups, rows are sorted by descending consistency. All 2 6 = 64 logically possible configurations of six conditions are displayed. Rows with frequency below 1.0 are logical remainders (marked LR) and are excluded from Boolean minimization unless invoked as counterfactuals. Consistency threshold for outcome assignment: 0.80.

#	II	IM	IS	IC	OS	FR	Freq.	Consist.	Raw Cov.	Out.	Notes
1	1	1	1	1	1	1	12.28	1.000	0.868	1	C05, C01, C11
2	1	1	1	1	1	0	3.58	0.990	0.250	1	C24, C18
3	1	0	1	1	0	1	3.10	0.968	0.212	1	C03, C24
4	1	1	1	1	0	1	3.68	0.973	0.253	1	C24, C03
5	1	1	1	1	0	0	3.70	0.915	0.239	1	C24, C18
6	1	1	1	0	0	1	3.45	0.940	0.229	1	C03, C24
7	1	0	1	0	0	1	3.38	0.906	0.217	1	C03, C09
8	0	0	1	0	0	1	3.35	0.836	0.198	1	C13, C09

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#	II	IM	IS	IC	OS	FR	Freq.	Consist.	Raw Cov.	Out.	Notes
9	1	1	1	0	0	0	3.32	0.898	0.210	1	C24, C18
10	1	0	1	0	0	0	3.12	0.862	0.190	1	C24, C18
11	1	1	0	1	1	1	2.98	0.984	0.205	1	C08, C02
12	1	1	0	1	1	0	2.85	0.970	0.192	1	C15, C12
13	1	1	0	0	1	1	2.72	0.944	0.177	1	C06, C14
14	1	1	0	1	0	1	2.60	0.918	0.167	1	C14, C24
15	1	0	0	1	1	1	2.51	0.952	0.161	1	C21, C17
16	1	1	0	0	0	1	2.48	0.884	0.152	1	C14, C18
17	1	1	0	0	1	0	2.39	0.917	0.148	1	C06, C21
18	1	0	0	1	0	1	2.32	0.870	0.143	1	C21, C14
19	0	1	1	0	0	1	2.25	0.843	0.133	1	C13, C09
20	1	1	0	1	0	0	2.18	0.888	0.130	1	C14, C18
21	1	0	1	1	1	1	2.10	0.961	0.141	1	C17, C19
22	1	0	0	1	1	0	2.02	0.938	0.126	1	C17, C21
23	0	1	0	1	1	1	1.95	0.901	0.119	1	C06, C14
24	0	0	1	1	0	1	1.88	0.860	0.113	1	C13, C24
25	1	0	1	1	1	0	1.80	0.949	0.118	1	C17, C21
26	0	1	1	1	0	1	1.72	0.832	0.108	1	C09, C13
27	1	0	0	0	1	1	1.65	0.891	0.104	1	C17, C21
28	0	1	0	0	1	1	1.58	0.844	0.099	1	C06, C21
29	0	1	1	1	1	0	1.50	0.888	0.096	1	C06, C12
30	0	0	1	1	1	1	1.42	0.854	0.090	1	C09, C24
31	0	1	0	1	0	1	1.35	0.820	0.082	1	C14, C24
32	0	0	0	1	1	1	1.28	0.806	0.079	1	C14, C06
33	0	0	1	0	0	0	3.06	0.795	0.172	0	C23, C24
34	0	0	0	0	0	0	6.14	0.286	0.124	0	C10, C16
35	0	0	1	0	1	0	1.20	0.776	0.075	0	C13, C23
36	0	0	0	0	1	0	1.12	0.720	0.068	0	C23, C04
37	0	0	0	0	0	1	1.05	0.652	0.061	0	C20, C16
38	0	0	0	0	1	1	0.98	0.611	0.056	0	LR
39	0	0	1	1	0	0	0.90	0.744	0.052	0	LR
40	0	0	0	1	0	0	0.82	0.598	0.046	0	LR
41	0	1	0	0	0	0	0.75	0.541	0.040	0	LR
42	0	0	0	1	0	1	0.68	0.559	0.036	0	LR
43	0	1	0	0	0	1	0.60	0.502	0.031	0	LR
44	0	1	0	0	1	0	0.52	0.558	0.029	0	LR
45	0	0	1	0	1	1	0.44	0.613	0.025	0	LR
46	0	0	0	1	1	0	0.37	0.565	0.020	0	LR
47	0	1	0	1	0	0	0.30	0.490	0.016	0	LR
48	1	0	0	0	0	0	0.22	0.672	0.013	0	LR
49	0	1	1	0	1	0	0.15	0.548	0.008	0	LR
50	0	1	1	0	0	0	0.08	0.479	0.004	0	LR
51	1	0	0	0	1	0	0.00	0.601	0.001	0	LR
52	0	1	0	1	1	0	0.00	0.557	0.001	0	LR
53	1	0	0	0	0	1	0.00	0.489	0.000	0	LR
54–64	Rows 54–64: Frequency = 0.00, Consistency = N/A (no empirical instances). Treated as logical remainders (LR) throughout Boolean minimization. Configurations include remaining combinations of conditions not observed in the 24-case sample.										

Appendix B. Full Truth Table — Negative Outcome (NEG), All 64 Rows

Rows are grouped by outcome assignment (Outcome = 1 first, then Outcome = 0). Within groups, rows are sorted by descending consistency. Logical remainder rows (frequency < 1.0) are marked LR. Consistency threshold for outcome assignment: 0.80.

#	II	IM	IS	IC	OS	FR	Freq.	Consist.	Raw Cov.	Out.	Notes
1	0	0	0	0	0	0	6.14	1.000	0.585	1	C10, C16, C04
2	1	0	1	0	0	1	3.38	1.000	0.323	1	C03, C09
3	0	0	1	0	0	1	3.35	1.000	0.320	1	C13, C09
4	1	0	1	0	0	0	3.12	1.000	0.297	1	C24, C18
5	1	0	1	1	0	1	3.10	1.000	0.296	1	C03, C24
6	0	0	1	0	0	0	3.06	1.000	0.291	1	C23, C24
7	1	1	1	0	0	1	3.45	0.995	0.327	1	C03, C24
8	1	1	1	0	0	0	3.32	0.977	0.309	1	C24, C18
9	1	1	1	1	0	1	3.68	0.942	0.331	1	C24, C03
10	1	1	1	1	0	0	3.70	0.927	0.327	1	C24, C18
11	1	1	1	1	1	0	3.58	0.825	0.281	1	C24, C18
12	0	0	1	0	1	0	1.20	0.896	0.086	1	C13, C09
13	0	0	0	0	0	1	1.05	0.940	0.093	1	C20, C07
14	0	0	1	1	0	1	1.88	0.872	0.166	1	C13, C09
15	0	0	0	0	1	0	1.12	0.815	0.090	1	C20, C23
16	0	0	1	1	0	0	0.90	0.842	0.074	1	LR

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#	II	IM	IS	IC	OS	FR	Freq.	Consist.	Raw Cov.	Out.	Notes
17	0	1	1	0	0	1	2.25	0.819	0.185	1	C13, C09
18	0	0	0	1	0	0	0.82	0.870	0.070	1	LR
19	0	1	0	0	0	0	0.75	0.841	0.063	1	LR
20	0	0	0	0	1	1	0.98	0.812	0.079	1	LR
21	1	1	1	1	1	1	12.28	0.238	0.279	0	C05, C01, C11
22	1	1	0	1	1	1	2.98	0.162	0.047	0	C08, C02
23	1	1	0	1	1	0	2.85	0.174	0.048	0	C15, C12
24	1	1	0	0	1	1	2.72	0.210	0.056	0	C06, C14
25	1	1	0	1	0	1	2.60	0.277	0.070	0	C14, C24
26	1	0	0	1	1	1	2.51	0.201	0.049	0	C21, C17
27	1	1	0	0	0	1	2.48	0.319	0.078	0	C14, C18
28	1	1	0	0	1	0	2.39	0.228	0.054	0	C06, C21
29	1	0	0	1	0	1	2.32	0.330	0.075	0	C21, C14
30	0	1	1	1	0	1	1.72	0.411	0.069	0	C09, C13
31	1	0	0	0	1	1	1.65	0.252	0.041	0	C17, C21
32	0	1	0	0	1	1	1.58	0.298	0.046	0	C06, C21
33	0	1	1	1	1	0	1.50	0.289	0.043	0	C06, C12
34	0	0	1	1	1	1	1.42	0.341	0.047	0	C09, C24
35	0	1	0	1	0	1	1.35	0.399	0.053	0	C14, C24
36	0	0	0	1	1	1	1.28	0.318	0.040	0	C14, C06
37	1	0	1	1	1	1	2.10	0.185	0.038	0	C17, C19
38	1	0	0	1	1	0	2.02	0.193	0.038	0	C17, C21
39	0	1	0	1	1	1	1.95	0.251	0.048	0	C06, C14
40	1	0	1	1	1	0	1.80	0.199	0.035	0	C17, C21
41	0	1	1	0	1	0	0.15	0.312	0.005	0	LR
42	0	1	0	0	0	1	0.60	0.408	0.024	0	LR
43	0	1	1	0	0	0	0.08	0.501	0.004	0	LR
44	0	1	0	1	0	0	0.30	0.425	0.012	0	LR
45	0	1	0	1	1	0	0.00	0.288	0.001	0	LR
46	1	0	0	0	1	0	0.00	0.261	0.001	0	LR
47	0	0	0	1	0	1	0.68	0.495	0.033	0	LR
48	0	0	1	0	1	1	0.44	0.461	0.020	0	LR
49	0	0	0	1	1	0	0.37	0.378	0.014	0	LR
50	1	0	0	0	0	1	0.00	0.411	0.000	0	LR
51	1	0	0	0	0	0	0.22	0.498	0.011	0	LR
52–64	Rows 52–64: Frequency = 0.00, Consistency = N/A (no empirical instances). Treated as logical remainders (LR) throughout Boolean minimization. Configurations include remaining theoretically possible combinations not observed in the 24-case sample.										

Appendix C. Calibration Procedure Technical Details

C.1 Logistic Calibration Function

The direct calibration method employs a logistic (sigmoid) transformation to map raw Likert-scale scores onto fuzzy-set membership values in the continuous [0, 1] interval. The logistic function ensures smooth, monotonic transformation with membership values approaching 0 at low raw scores and approaching 1 at high raw scores, with the rate of transformation governed by the specified qualitative anchors. The general form of the calibration function is:

where fs(x) is the calibrated fuzzy-set membership score for a case with raw score x, slope controls the steepness of the transformation curve, and intercept determines its horizontal displacement. The slope and intercept are derived algebraically from the three qualitative anchor values specified by the researcher.

C.2 Derivation of Slope and Intercept

Given the logistic function, the slope is computed as follows. Let "lo" denote the full non-membership anchor raw score, "hi" denote the full membership anchor raw score, and cross denote the crossover point raw score. The membership value at the full non-membership anchor is set to approximately 0.05 (i.e., the log-odds = $\log(0.05/0.95) \approx -2.944$), and the membership value at the full membership anchor is set to approximately 0.95 (i.e., the log-odds = $\log(0.95/0.05) \approx +2.944$). The slope is therefore:

The crossover point is the raw score at which the log-odds equals zero (i.e., membership = 0.50 exactly), which is enforced by setting the intercept to −slope × cross. This guarantees that fs(cross) = $1/(1 + \exp(0)) = 0.50$ precisely, satisfying the qualitative anchor requirement.

C.3 Anchor Values Applied in This Study

The following qualitative anchors were applied uniformly across all six causal conditions (II, IM, IS, IC, OS, FR) and both outcome variables (POS, NEG):

Anchor	Raw Score Value	Target Fuzzy Score	Substantive Interpretation
Full non-membership (lo)	1.0	≈ 0.050	Clearly below average; meaningful but decidedly outside the set
Crossover point (cross)	2.0	= 0.500	Scale midpoint; maximum membership ambiguity
Full membership (hi)	3.5	≈ 0.950	High expression; clearly inside the set, not necessarily perfect

C.4 Verification of Anchor Mapping

The calibration function can be verified by substituting each anchor raw score:

Raw Score (x)	Argument: 2.355x − 4.710	exp(−argument)	fs(x) = 1/(1+exp(−arg))
1.0 (lo)	2.355(1.0) − 4.710 = −2.355	exp(2.355) = 10.538	1/(1 + 10.538) = 0.087
2.0 (cross)	2.355(2.0) − 4.710 = 0.000	exp(0) = 1.000	1/(1 + 1.000) = 0.500
3.5 (hi)	2.355(3.5) − 4.710 = 3.533	exp(−3.533) = 0.029	1/(1 + 0.029) = 0.972

C.5 Handling of Crossover-Point Cases

Cases with raw scores at the exact crossover point (x = 2.0) receive a calibrated fuzzy-set membership score of exactly 0.50, placing them at the point of maximum membership ambiguity. fsQCA convention holds that cases with membership scores of exactly 0.50 should be excluded from sufficiency analysis because they provide ambiguous set-theoretic information (Ragin, 2008; Schneider and Wagemann, 2012). In the present dataset, Case C03 has an IM score of 0.500 and Case C24 has IC and OS scores of 0.500, reflecting raw scores at or near the crossover anchor. These cases are retained in the analysis but flagged as potentially ambiguous contributors to configurations that include IM, IC, or OS, respectively. Sensitivity analyses (not reported) excluding exact-0.50 cases did not materially alter the solution terms or overall coverage and consistency statistics.

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