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Identifying behavioral components as microfoundations of collective leadership

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Objective: Collective leadership is increasingly viewed as essential in complex, interprofessional work, yet its behavioral microfoundations remain underspecified. This study conceptualized and measured Collective Leadership Behaviors (CLB)—observable, enactable actions through which any team member, regardless of formal role, exerts positive influence that contributes to a team's direction, alignment, and commitment.

Methods: Study 1 elicited concrete leadership and followership behaviors from professionals in a large acute-care hospital using open-ended responses. Derived behavioral descriptions informed item generation, followed by exploratory and hierarchical factor analyses to identify the behavioral structure and to develop a concise self-assessment instrument, the Scale of Collective Leadership Behaviors (SCLB). Study 2 used an independent healthcare sample to test the factor structure via confirmatory factor analysis and to examine associations of CLB with established leadership and teamwork competencies, perceived psychological safety (by referent), and adaptive work outcomes.

Results: CLB were represented by four higher-order and seven lower-order factors, forming the empirical basis for the 35-item SCLB. Confirmatory factor analysis supported the proposed structure. Perceived psychological safety in relation to leaders and peers was positively associated with multiple CLB dimensions, whereas safety at the team-as-a-whole referent showed no significant associations. Several CLB dimensions were, in turn, associated with higher work fulfillment and greater workload manageability.

Conclusion: By specifying CLB as measurable behavioral microfoundations, this study links process-oriented theories of collective leadership with an actionable construct for assessment and development in healthcare teams. The findings further suggest a relational–behavioral loop in which relational safety at proximal interpersonal levels is intertwined with members' enactment of collective influence.

KEYWORDS

behavioral microfoundations, collective leadership, DAC framework, healthcare teams, psychological safety, scale development, self-assessment

Introduction

Background and theoretical issues

In contemporary workplaces, increasing task complexity and professional specialization have made interprofessional collaboration a central mode of organizational operation. Consequently, traditional hierarchical organizations (Mintzberg, 1979), which rely on vertical leadership and lack the flexibility to adapt to rapid environmental and situational changes, are often less effective in modern team settings. Against this backdrop, leadership scholarship has increasingly shifted from individual traits and behaviors toward relational dynamics and interactive processes that unfold across collectives (Denis et al., 2012; Raelin, 2016). This shift has brought growing attention to plural leadership, an umbrella perspective in which leadership functions are accomplished by more than one actor.

Within this overarching framework, three major approaches can be identified. Shared leadership focuses on structural configurations of shared influence among team members; distributed leadership extends this view by incorporating institutional, social, and network arrangements as well as practice. Collective leadership places greater emphasis on the interactive and generative processes through which members co-create leadership as an integrated collective entity.

Although these approaches exist along a continuous and overlapping spectrum (Friedrich et al., 2009; 2016; Ospina et al., 2020), a conceptual distinction can be drawn: shared and distributed leadership primarily address structural phenomena at the group level, focusing on how leadership roles, tasks, or influence are allocated across multiple actors and/or embedded in organizational arrangements (e.g., Spillane, 2006).

In contrast, collective leadership concerns phenomena at the individual and relational levels, defined as a generative, interaction-based process through which leadership is co-produced in ongoing relationships and moment-to-moment practices, such that direction, alignment, and commitment (DAC) emerge through mutual influence regardless of formal positions (Drath et al., 2008; Raelin, 2016). This view complements structural accounts by specifying how influence is enacted in interaction.

Collective leadership has gained increasing attention in collaboration-based domains such as healthcare, education, and public administration—fields in which outcomes and safety depend heavily on team-level interactions (Raelin, 2016; Friedrich et al., 2016). Although this concept is relatively recent, its roots can be traced back to early definitions of leadership as a social influence phenomenon independent of formal position or authority (Bass, 1960; Yukl, 2010; Northouse, 2021). Following this foundational definition, leadership is best understood as influence enacted across members rather than as leader-exclusive behavior. Accordingly, behaviors traditionally examined in follower research (e.g., followership behaviors) can also be reframed as enactable practices through which any member contributes to collective leadership and team goal attainment. Uhl-Bien's (2006) Relational Leadership Theory (RLT) similarly emphasizes that leadership is constituted in relationships and interaction, placing members' actions at the center of influence.

Many studies on collective leadership conceptualize leadership as a relational practice (Raelin, 2016; Ospina et al., 2020), emphasizing the meaning-making processes that occur through interactions and dialogue among members. However, less is known about how leadership is relationally constructed through measurable patterns of behavior—that is, what kinds of actions and utterances and under what conditions generate mutual influence. For example, qualitative accounts of “leaderful moments” richly describe co-creation in practice but often did not specify its behavioral components in measurable terms (Wood and Ladkin, 2008).

To address this gap, the microfoundations perspective in organizational theory (Barney and Felin, 2013) provides a useful framework: explaining macro-level outcomes and emergent phenomena requires attention to the micro-level actions and interactions that generate them. Applied to leadership, this implies that understanding collective leadership as an emergent influence process requires specifying its behavioral micro-units—the observable, fine-grained acts through which mutual influence is enacted in interaction. Prior field research has begun to operationalize collective leadership in behavioral terms and link it to team effectiveness (Hiller et al., 2006), and related theorizing has described collective leadership primarily in functional and process terms (Marks et al., 2001; Morgeson et al., 2010; Yukl, 2012). However, existing operationalizations have largely captured collective leadership at the level of broad functional domains or roles, leaving the fine-grained behavioral micro-units—the specific acts and utterances through which influence is enacted—underspecified and difficult to measure or target for intervention (Uhl-Bien, 2006; Raelin, 2016).

Positioned within this stream, the present study advances a behavioral microfoundations account of collective leadership by examining how CLB items cluster into empirically distinguishable dimensions. Building on prior functional and practice-based theorizing, we expect these behaviors to organize around domains that support (a) task regulation and coordination, (b) information exchange and member-initiated proactivity that facilitate adaptive coordination, (c) relational enabling conditions (e.g., support and respect) that sustain mutual influence, and (d) a collective orientation that aligns members toward shared purpose and sustained engagement (Marks et al., 2001; Morgeson et al., 2010; Yukl, 2012; Uhl-Bien, 2006; Raelin, 2016). Several of these behaviors have often been treated as “followership” in role-based accounts; here, they are reframed as enactable practices through which any member can contribute to collective leadership processes.

This mapping strengthens the conceptual grounding of CLB by clarifying how its subdimensions jointly constitute a behavioral repertoire through which direction, alignment, and commitment are generated in interaction (Drath et al., 2008).

Building on the above discussion, we conceptualize Collective Leadership Behaviors (CLB) as observable, enactable behavioral microfoundations through which any team member can generate and sustain mutual influence in interaction, thereby co-producing direction, alignment, and commitment/performance. This behavioral focus is distinct from structural indices of leadership distribution, even when CLB coexists with distributed leadership arrangements.

Conceptual foundation and measurement approach

The concept of CLB aligns with the Direction–Alignment–Commitment (DAC) framework proposed by [Drath et al. \(2008\)](#). The DAC model defines leadership as the process that generates three collective outcomes—shared direction, coordinated alignment of actions, and mutual commitment among members. Complementarily, the Leadership-as-Practice (LaP) perspective ([Raelin, 2016](#)) focuses on how leadership emerges interactively through everyday practices. Whereas the DAC framework emphasizes what leadership produces (its outcomes), and LaP emphasizes how it occurs in practice, CLB specify the concrete actions through which members generate DAC outcomes in interaction.

From this standpoint, leadership is understood not as an individual attribute but as a relational process embedded in team interactions, and CLB capture the observable behavioral micro-units through which DAC outcomes are generated. At the individual level, the capacity to enact CLB can be viewed as a relational capability—i.e., the skill to select and perform these behaviors appropriately in interaction.

CLB encompass not only traditional leader actions such as directing, supporting, and decision-making, but also member-driven activities including collaboration, knowledge sharing, speaking up to foster psychological safety ([Edmondson, 1999](#)), and helping behaviors—i.e., leading-with behaviors in which members mutually guide and influence one another ([Raelin, 2016](#)). In this way, CLB conceptualize leadership not merely as acts of influencing others, but as interactional practices through which members coordinate, support, and guide one another.

A common approach to measuring leadership involves other-ratings, in which team members evaluate the extent to which each individual exhibits leadership behaviors. Although such methods are effective for capturing the overall perception of leadership within a team, they are limited in directly identifying which behaviors influence other members or the team as a whole. Prior field survey research has operationalized collective leadership in behavioral terms and linked it to team effectiveness ([Hiller et al., 2006](#)). Against this backdrop, specifying enactable influence behaviors as behavioral micro-units becomes crucial for theory because collective leadership is generated through interaction. From this perspective, the present study adopts a self-assessment approach to measuring CLB. Many leadership behaviors are momentary, informal acts—such as offering support, or suggesting ideas—guided by internal intentions that are not easily captured through external observation ([Corneille and Gawronski, 2024](#)). While self-reports are subject to biases, self-assessment is well suited here because it captures actors' intentions and appraisals underlying informal enactments.

Moreover, multi-source leadership research suggests that integrating self- and other-ratings can yield a more nuanced understanding of leadership behavior, particularly when considering self-other (dis)agreement in leadership perceptions ([Atwater and Yammarino, 1992](#); [Fleenor et al., 2010](#)). Thus, self-assessed CLB can be positioned as an appropriate approach for characterizing the behavioral foundations of collective leadership.

By aggregating these individual-level data, we can approximate team-level patterns of enacted leadership, thereby responding to the call to link micro-level behaviors with macro-level team outcomes ([Barney and Felin, 2013](#)).

To obtain practical and empirical insights into the behavioral foundations of collective leadership, the present study focuses on healthcare settings as an industrial and organizational field. Healthcare teams exhibit paradoxical characteristics: professionals from distinct domains—such as physicians, nurses, and allied health staff—must collaborate under conditions of high interdependence, while simultaneously operating within a rigid professional hierarchy ([Nembhard and Edmondson, 2006](#)). Physicians in particular often assume dominant leadership roles ([Essex et al., 2023](#)), and such hierarchical structures, while historically entrenched, have been noted to foster organizational rigidity in contemporary contexts where interprofessional teamwork is essential ([Hughes and Salas, 2013](#)). As a result, team communication deteriorates ([Leonard et al., 2004](#); [O'Daniel and Rosenstein, 2008](#)), and hierarchical decision-making can delay responses and reduce adaptability to rapidly changing clinical conditions and patient needs ([Essex et al., 2023](#)). Consequently, lateral support and information sharing across hierarchies are indispensable ([Edmondson, 1999](#); [Vogus and Sutcliffe, 2012](#)). To maintain safety and performance, all members—regardless of rank or tenure—mutually influence one another through the enactment of CLB. Thus, healthcare settings represent a theoretically meaningful and practically valuable field for observing and measuring collective leadership in action.

Purpose and significance of the study

The purpose of this study is to examine how CLB—behaviors through which leaders and followers mutually exert positive influence beyond formal roles—enable collective leadership within teams and contribute to key psychological and behavioral outcomes. Prior research on collective leadership has emphasized a process perspective that explores how influence co-emerges among members, thereby theorizing the generative mechanisms of leadership. However, these processes have remained difficult to specify and measure in behavioral terms.

Leadership is, by nature, not a static individual attribute but a socially constructed phenomenon that unfolds through interactions among members ([Uhl-Bien, 2006](#)). Therefore, understanding the co-creation process of collective leadership requires conceptualizing it as patterns of behavioral exchanges in which members continuously influence one another ([Marks et al., 2001](#)). This study aims to identify the influence behaviors that team members mutually enact and to visualize these behavioral exchanges in order to establish a theoretical foundation for explaining the co-creation of collective leadership as a layered behavioral process. Through this approach, the study seeks to offer a new paradigm that concretizes the abstract theory of collective leadership at an observable and measurable behavioral level.

The theoretical contribution of this study lies in proposing the concept and measurement framework of CLB, thereby

establishing a basis for identifying the behavioral units that constitute collective leadership and for empirically analyzing its generative mechanisms. Practically, this study offers behavioral guidelines for fostering lateral collaboration and mutual influence in high-reliability teams—such as those in healthcare settings where hierarchical structures and professional specialization coexist—by clarifying how members can collaboratively exercise leadership through specific behaviors, thus providing a foundation for the design of behaviorally grounded interventions to foster collective leadership. Looking ahead, the study envisions aggregating self-assessment data at the team level and triangulating them with other-ratings and observational data to examine the mutual and recursive relationship between CLB and collective leadership as enacted in teams. Establishing such a behavioral foundation is expected to deepen empirical understanding of the co-creative process of collective leadership and open new directions for both scholarly inquiry and practical application.

It is also important to examine these behaviors within the Japanese organizational context. Norms emphasizing harmony and high-context, implicit coordination may, in some settings, shift collective leadership behaviors toward less publicly agentic and more situationally embedded enactment—for example, influence exercised through behind-the-scenes alignment, anticipatory role-taking, and indirect voice—rather than the explicit, individually articulated forms often foregrounded in Western models (Misumi, 1985; Hall, 1976; Hofstede, 2001). Accordingly, what appears as “low” collective leadership in Western-coded indicators may partly reflect differences in behavioral expression and observability, underscoring the need for culturally sensitive operationalization (Markus and Kitayama, 1991).

Study 1

The purpose of Study 1 is to clarify the structural classification and measurability of CLB—members’ positive influence behaviors toward team goal attainment. Through a bottom-up process of item generation and classification following established psychometric scale development procedures, this study aims to identify CLB that can be enacted by all members—regardless of profession, hierarchical position, or level of experience—even within highly hierarchical and high-reliability organizational contexts such as healthcare settings. This healthcare setting was selected to maximize the likelihood of capturing a broad repertoire of coordination-relevant leadership behaviors in naturally occurring interdependent teamwork.

Preliminary survey

Item collection

An online survey was conducted via Google Forms among staff members involved in medical safety at Hospital A, a designated advanced acute-care hospital with 751 beds. After

TABLE 1 Demographic characteristics of respondents.

Characteristic	Preliminary Survey	Study 1	Study 2
Gender			
Female	70	211	207
Male	22	63	51
No response	3	4	2
Age			
20s or younger	6	58	40
30s	18	70	61
40s	23	72	93
50s	15	48	55
60s or older	5	18	5
No response	28	12	6
Occupation			
Physician	19	47	22
Nursing staff	68	153	197
Medical technologist	7	50	21
Administrative staff	1	28	20
Years of professional experience			
≤ 2 years	1	45	29
3–5 years	8	34	24
6–9 years	6	27	20
10–19 years	25	73	84
20–29 years	34	61	71
≥ 30 years	21	38	32

providing demographic information, participants were asked to freely describe up to three behaviors each for leaders and followers whom they perceived as exerting a positive influence on the team as a whole or on other members. A total of 251 responses were collected, and data from 95 respondents who reported having at least a moderate level of experience working in medical teams (a rating of 4 or higher on a 7-point scale) were retained for analysis (see Table 1). This exclusion criterion was applied because participants with limited team experience were considered less likely to provide reliable descriptions of collective leadership behaviors.

Item refinement

From the open-ended responses, 246 behavioral descriptions were obtained. The first and second authors collaboratively reviewed and consolidated identical responses (resulting in 158 unique items) and further grouped semantically similar items into broader behavioral categories (88 categories). Representative item statements were then developed for each category. The third author independently reviewed and verified the final item set.

Materials and methods

Participants

An online survey was conducted via Google Forms with staff members employed at Hospital B, a large-scale advanced acute-care hospital with 661 beds. Participants were recruited across multiple hospital departments, including inpatient wards, outpatient services (e.g., emergency), surgical units, rehabilitation, pharmacy, nutrition services, laboratory/clinical engineering, medical information/medical devices, and administrative/liaison divisions. A total of 278 individuals participated in the survey (see Table 1).

Questionnaire

After providing demographic information, participants responded to the 88 items generated in the preliminary study. They were asked to rate the extent to which they personally performed each behavior during team activities, using a seven-point Likert scale (1 = not at all true of me to 7 = completely true of me).

Statistical analysis

This study conceptualized collective leadership as a multidimensional aggregation of diverse behaviors, assuming the presence of higher-order factors that organize these behaviors hierarchically. Based on this multidimensional and hierarchical theoretical framework, hierarchical factor analysis was employed to examine the underlying structure. This approach is suitable for comprehensively understanding the components of psychological traits and team behaviors (e.g., Reise et al., 2010).

Although bifactor modeling can also estimate both general and specific factors, it assumes orthogonality among them and is primarily designed for testing unidimensionality. In contrast, the hierarchical factor analysis used in this study is theoretically more consistent with the nested and interactive structure of CLB, which presumes intercorrelations among lower-order factors that together form higher-order dimensions.

To identify higher-order factors, exploratory factor analysis (EFA) was conducted using the maximum likelihood method with promax rotation, and the number of factors was determined based on the scree test. (All EFAs reported below used these same analytical settings unless otherwise specified.) Items were retained if they had primary loadings ≥ 0.40 or ≤ -0.40 (the “0.40 criterion”). Items that did not load on any factor or cross-loaded on multiple factors were removed to achieve a simple structure. Subsequently, separate EFAs were conducted for the items loading on each higher-order factor to identify the lower-order factors, again using the 0.40 criterion. Reliability for each factor was assessed using McDonald's ω (total reliability; ω_{total}).

Next, to develop a concise scale for applied organizational settings, we constructed a shortened version of the CLB measure. Specifically, exactly five representative items were retained for each lower-order factor to ensure balanced representation across

behavioral domains and to avoid disproportionate weighting due to unequal subscale lengths. This item-reduction procedure was intended to reduce respondent burden and improve feasibility in field surveys while preserving the conceptual breadth of the domains (Clark and Watson, 1995; DeVellis, 2017). Using the second-stage EFAs conducted for each higher-order dimension, items were considered within each lower-order factor and prioritized based on the magnitude of their primary factor loadings. The first and second authors then jointly reviewed top-loading items to (a) minimize redundancy in behavioral content (e.g., overlapping behaviors or near-identical wording), (b) maintain conceptual coverage within each behavioral domain, and (c) prioritize wording that could be enacted by team members regardless of profession or formal role. When two items were judged conceptually redundant, we retained the item with the higher loading and/or clearer, more role-general wording.

We then examined whether the shortened version maintained the original measurement properties. First, EFAs were conducted on the items within each higher-order dimension. Second, correlations among lower-order factors were inspected using composite scores. Finally, confirmatory factor analysis (CFA) was performed to evaluate model fit. Drawing on Hu and Bentler (1999), we used CFI ≥ 0.95 , SRMR ≤ 0.08 , and RMSEA ≤ 0.06 as benchmarks for good fit. However, acknowledging that these cutoffs can be overly stringent (Marsh et al., 2004), we also considered RMSEA values up to 0.08 as indicating reasonable fit (Browne and Cudeck, 1993). Model fit was thus evaluated holistically by considering multiple indices.

Ethical considerations

The study was approved by the respective institutional review boards of both hospitals (Hospital A: 2023419; Hospital B: 2023021). Participants received an information sheet describing the study's purpose and procedures, emphasizing voluntary participation and confidentiality of responses. Those who agreed to participate accessed the survey via a URL provided in the recruitment letter. Upon accessing the Google Forms page, participants were shown the same explanation again and proceeded to the questionnaire only after providing explicit informed consent. Those who declined were immediately exited from the survey.

Results

A hierarchical factor analysis was conducted to explore the structural composition of CLB. The initial exploratory factor analysis (EFA) identified four higher-order factors. Items showing the highest loadings were distributed across these four factors, with 34 items on the first, 15 on the second, 14 on the third, and 25 on the fourth. Based on content analysis, the first factor was labeled task-oriented leadership ($\omega = 0.984$), the second social-oriented leadership ($\omega = 0.961$), the third membership ($\omega = 0.930$), and the fourth fellowship ($\omega = 0.961$).

To address potential common method bias (CMB), we implemented procedural remedies, including ensuring participant anonymity and emphasizing that there were no right or wrong

answers. Additionally, Harman's single-factor test was performed as a statistical check. The results showed that the largest factor accounted for only 42.7% of the variance, suggesting that no single dominant factor explains the majority of the variance and that CMB is unlikely to be a pervasive concern.

Subsequent EFAs were conducted for each higher-order factor using the $|0.40|$ loading criterion to identify the lower-order structures. Within the first factor, task-oriented leadership, one item was removed, yielding two subdimensions: Team Management (18 items; $\omega = 0.921$) and Direction-giving (15 items; $\omega = 0.875$). The second factor, social-oriented leadership, retained all items and consisted of a single subdimension, Member Support (15 items; $\omega = 0.858$). The third factor, membership, retained all items and was divided into Initiative-taking (8 items; $\omega = 0.852$) and Cognition-sharing (6 items; $\omega = 0.849$). Finally, the fourth factor, fellowship, had two items removed and was separated into Member Respect (15 items; $\omega = 0.822$) and Team Orientation (8 items; $\omega = 0.846$).

To enhance the practicality of the scale for both research and field use, the number of items was reduced to create a concise version. To ensure balanced representation across the seven behavioral domains and to avoid disproportionate weighting due to unequal subscale lengths, exactly five items were retained for each lower-order factor, resulting in the 35-item Scale of Collective Leadership Behaviors (SCLB).

To verify that the shortened version retained the same structure as the original 88-item version, EFAs were performed separately for each higher-order factor. The factor structure of the SCLB was found to be identical to that of the full version (Table 2).

Item reduction for the 35-item SCLB followed a two-pronged approach combining statistical and theoretical criteria. Statistically, we prioritized items that showed stronger standardized loadings on the intended lower-order factor, minimal cross-loadings, and no deterioration in internal consistency (e.g., omega/alpha-if-deleted). We also inspected inter-item correlations to avoid redundancy and retained items that contributed unique information within each subscale. Theoretically, we ensured content coverage of each behavioral domain and prioritized wording that would be applicable across team members' roles and organizational contexts.

Correlational analysis among the lower-order factors showed coefficients ranging from 0.328 to 0.825 (Table 3). Although the correlations were relatively high, this finding aligns theoretically with the concept of collective leadership, which assumes that behavioral dimensions are not independent but complementary and mutually reinforcing in generating collective leadership outcomes.

Finally, a confirmatory factor analysis (CFA) was conducted to assess model fit. The results indicated acceptable fit indices (CFI = 0.994, SRMR = 0.017, RMSEA = 0.080), supporting the structural validity of the 35-item SCLB.

Discussion

Although this study aimed to develop a self-assessment scale, the initial item collection phase focused on identifying leadership behaviors as socially recognized influence actions by

asking participants to freely describe leadership behaviors they had observed among other members within their teams. Consequently, the identified items and factors represent the construct of socially constructed leadership (Uhl-Bien, 2006).

The questionnaire results confirmed that CLB consists of a four-factor higher-order structure, each encompassing multiple lower-order dimensions. The four higher-order factors—task-oriented leadership, social-oriented leadership, membership, and fellowship—collectively function to sustain leadership at the team level through complementary roles. These factors can be organized along a conceptual matrix defined by the axes of “higher-general” and “task-relationship.” Specifically, task-oriented leadership corresponds to the higher-task quadrant, social-oriented leadership to the higher-relationship quadrant, membership to the general-task quadrant, and fellowship to the general-relationship quadrant. High positive correlations were observed among factors belonging to the same categorical domains, while item content analysis suggested that each factor captures leadership grounded in different roles, perspectives, and value orientations within the team.

Among the higher-order factors, membership and fellowship represent everyday influence behaviors enacted by all members regardless of position or formal role. Traditionally, such behaviors have been treated as distinct from leadership and examined under the framework of followership. However, this study returns to a foundational definition of leadership as the process of influencing others toward the attainment of team or organizational goals and integrates these behaviors as essential components of leadership contributing to team functioning, performance, and wellbeing. As articulated in Relational Leadership Theory (Uhl-Bien, 2006), leadership is not confined to designated individuals but emerges as a dynamic interaction within relationships. This perspective aligns with the essence of collective leadership, in which all members of an organization actively co-create leadership in interaction and collaboratively pursue collective goals. In this sense, collective leadership does not simply refer to the collective enactment of diverse team-oriented functions—such as direction-setting, coordination, support, and contribution—across multiple members depending on situational demands. Accordingly, membership and fellowship behaviors play a pivotal role in facilitating these interactive team processes.

The identified factors represent behavioral foundations necessary for the effective functioning of collective leadership. Restricting leadership to the sharing of formal leader functions, as in traditional interpretations of role-allocation views of plural leadership, risks overlooking the significance of diverse influence behaviors and the practical expertise and supportive acts exhibited by followers. In contemporary work teams, where psychological safety and mutual support are emphasized, such cross-role and reciprocal influence chains across roles and statuses directly contribute to team performance (Edmondson, 1999; Wang et al., 2014; Kozlowski and Bell, 2003). Hence, active engagement and mutual assistance among members are indispensable for the emergence of collective leadership and for achieving team effectiveness.

From a functional perspective, this study distinguishes “higher” and “general” factors not in terms of hierarchical status but in

TABLE 2 Factor loadings of the Collective Leadership Behaviors Scale (SCLB).

Item	Factor 1	Factor 2		
Task-Oriented Leadership $\omega = 0.984$		Team Management	Direction-giving	Community
47	Facilitates meetings smoothly	0.939	-0.084	0.763
43	Summarizes opinions and builds consensus	0.841	0.054	0.783
83	Leads and coordinates the team	0.615	0.213	0.635
52	Manages team tasks and schedules	0.593	0.254	0.659
48	Creates an environment that enables team activity	0.549	0.327	0.699
86	Clearly conveys goals and obtains agreement	-0.003	0.843	0.707
78	Maintains a bird's-eye view of the overall situation	0.072	0.731	0.625
38	Shares emerging problems with the team	0.056	0.638	0.468
27	Presents clear and concrete visions, policies, or goals	0.203	0.567	0.548
53	Makes calm and accurate decisions	0.334	0.470	0.585
	$\omega =$	0.921	0.875	
Social-Oriented Leadership $\omega = 0.961$		Member Support		Community
15	Proactively helps members in need	0.873		0.763
11	Takes the lead when necessary	0.802		0.642
1	Checks progress and provides needed support	0.708		0.501
18	Does not hesitate to make personal sacrifices	0.676		0.456
6	Creates an approachable and supportive atmosphere	0.594		0.353
	$\omega =$	0.858		
Membership $\omega = 0.930$		Initiative-taking	Cognition-sharing	Community
57	Acts proactively toward team goals	0.934	-0.088	0.753
54	Voluntarily takes on tasks and roles	0.714	0.086	0.613
5	Engages in continuous self-development	0.621	-0.016	0.370
64	Acts according to personal beliefs and goals	0.617	0.073	0.456
40	Completes plans through to the end	0.549	0.191	0.500
50	Reports, communicates, and consults with others	0.006	0.811	0.665
34	Repeats instructions to confirm understanding	-0.103	0.717	0.411
79	Adheres to deadlines and rules	0.125	0.596	0.486
35	Clearly states what one can and cannot do	0.247	0.531	0.545
56	Confirms to prevent misunderstandings	0.358	0.453	0.585
	$\omega =$	0.852	0.849	
Fellowship $\omega = 0.961$		Member Respect	Team Orientation	Community
87	Avoids words that might offend members	0.843	-0.012	0.697
66	Refrains from making negative comments	0.807	-0.098	0.551
81	Expresses gratitude and appreciation, even for small things	0.638	0.144	0.556
77	Greets others and responds appropriately	0.558	0.121	0.420
51	Avoids unnecessary interference in others' work	0.435	0.064	0.332
20	Actively participates in team activities	-0.155	0.917	0.666
8	Provides positive feedback	0.062	0.674	0.517
45	Works collaboratively rather than individually	0.098	0.618	0.477
19	Does not insist on one's own opinion	0.168	0.576	0.496
22	Interacts with an accepting attitude	0.299	0.452	0.482
	$\omega =$	0.822	0.846	

Boldface indicates the highest factor loading for each item.

TABLE 3 Inter-factor correlations.

Factor	Direction-giving	Member Support	Initiative-taking	Cognition-sharing	Member Respect	Team Orientation
Team Management	0.825	0.779	0.674	0.478	0.328	0.648
Direction-giving		0.823	0.834	0.658	0.610	0.766
Member Support			0.732	0.591	0.563	0.798
Initiative-taking				0.719	0.669	0.769
Cognition-sharing					0.678	0.705
Member Respect						0.764

All coefficients represent Pearson's correlation coefficients among the seven lower-order factors of the Collective Leadership Behaviors Scale (SCLB).

terms of structural role differentiation, positioning both as essential forms of CLB necessary for team functioning. Indeed, in the open-ended responses of the preliminary survey, participants frequently reported that they were positively influenced not only by formal leaders' actions but also by members' task-oriented and cooperative behaviors. For example, Initiative-taking—a member's persistent and self-initiated effort toward team goals—was often perceived by others as a leadership act. Such behaviors can be viewed as a form of charismatic influence (Conger and Kanungo, 1987), inspiring others through exemplary dedication and embodying shared values that intrinsically motivate teammates (Bass, 1985). These subjective evaluations from field settings expand the conceptual boundaries of leadership, suggesting that a variety of behaviors within a team can function as leadership.

The structural model identified in this study thus extends existing leadership theories while advancing the notion of collective leadership beyond position- or ability-based definitions. It reconceptualizes leadership as action in practice—a behavioral phenomenon that can be exercised by anyone in daily work contexts. From this perspective, leadership practice is no longer confined to “formal leaders,” but becomes a collective and accessible process in which all members can participate, thereby democratizing the enactment of leadership in organizational life. The behaviors identified in Study 1, such as “Read the atmosphere and adjust,” reflect the cultural characteristics of Japanese healthcare teams. In such high-context cultures (Hall, 1976), mutual monitoring and subtle adjustments are essential for maintaining team cohesion and safety, suggesting that the enactment of CLB is deeply embedded in cultural communication styles (Hara, 2003).

Study 2

The purpose of Study 2 was to examine the structural validity and construct validity of the Collective Leadership Behaviors Scale (SCLB) developed in Study 1 and to evaluate whether the pattern of associations among perceived psychological safety, CLB, and work adaptation is consistent with a behavioral microfoundations account of collective leadership. Specifically, we tested whether the hierarchical structure identified in Study 1 could be replicated in an independent sample and whether CLB showed theoretically coherent relations with psychological safety and work adaptation.

As a supplementary construct-validity check, we also examined correlations with selected existing leadership and teamwork competency measures.

Materials and methods

Participants

The survey was conducted online using Google Forms with staff members employed at Hospital A. A total of 260 respondents participated in the study (see Table 1).

Questionnaire

After completing demographic items, participants responded to the 35-item SCLB developed in Study 1, which measures seven subdimensions—Team Management, Direction-giving, Member Support, Initiative-taking, Cognition-sharing, Member Respect, and Team Orientation. Responses were provided on a seven-point Likert scale (1 = not at all true of me, 7 = completely true of me).

To provide a supplementary construct-validity check, participants also completed the Conceptual Model of Leadership Scale (Pearce and Sims, 2002). To reduce respondent burden while maintaining balanced coverage across subcategories, we retained four items per subcategory, yielding 20 items assessing transformational, directive, transactional, aversive, and empowering leadership styles, rated on a five-point scale (1 = not at all true, 5 = very true). In addition, participants completed the Leadership and Teamwork Competency Scales (Aikawa et al., 2012; 15 items; 6-point scale). Construct validity was evaluated as a pattern of correlations (i.e., within a nomological network), rather than by any single criterion coefficient.

We evaluated construct validity—encompassing convergent and discriminant aspects—by pre-specifying correlation patterns between the SCLB subdimensions and conceptually related vs. non-corresponding constructs (i.e., a nomological network). Convergently, task-oriented SCLB domains (Team Management, Direction-giving) were expected to show comparatively stronger associations with theoretically proximal task/coordination constructs (e.g., Performance Guidance, Problem Solving) and comparatively weaker associations with primarily relational constructs (e.g., Relationship Building, Fairness and Equity),

relative to the corresponding relational SCLB domains (Member Support, Member Respect, Team Orientation). Likewise, relational SCLB domains were expected to show comparatively stronger associations with relational constructs and comparatively weaker associations with task-centric constructs. We used these a priori expectations to interpret correlation magnitudes as construct-validity evidence rather than treating any single coefficient as a standalone criterion.

This approach follows the logic of construct validation, in which evidence is evaluated as a pattern of relationships within a nomological network. Accordingly, comparatively stronger correlations with conceptually adjacent leadership and teamwork constructs were treated as convergent evidence, whereas weaker correlations with theoretically distinct constructs were treated as discriminant evidence. This pattern-based interpretation provides construct-validity evidence for the SCLB without relying on any single “criterion” correlation.

To assess the psychological mechanisms underlying CLB, the study measured perceived psychological safety, a construct shown to facilitate proactive and positive influence behaviors in teams (Edmondson, 2002). The Workplace Psychological Safety Scale (O’Donovan et al., 2020) was used, comprising 19 items evaluating perceptions of psychological safety in relation to the team leader, other team members, and the team as a whole. Responses were given on a seven-point scale (1 = strongly disagree, 7 = strongly agree).

Finally, to examine the effect of CLB on work adaptation, nine items from the Scale of Interprofessional Motivation and Satisfaction (SIMS) (Fujimoto et al., 2021) were used to measure two subdimensions: work fulfillment and workload manageability. Participants responded on a seven-point scale (1 = strongly disagree, 7 = strongly agree).

Statistical analysis

First, a confirmatory factor analysis (CFA) was conducted to test the fit of the CLB model identified in Study 1. Second, to examine the predictive effects of CLB on psychological and behavioral outcomes, multiple regression analyses were conducted, controlling for gender (1 = male, 2 = female), years of experience, and team role. Team roles were dummy coded such that subleaders and followers were coded as 1 and compared against leaders (coded as 0). Third, partial correlation analyses were performed to assess construct validity by examining the relationships between SCLB subfactors and existing leadership and competency constructs, while controlling for gender, years of professional experience, and team role (subleader or follower).

Ethical considerations

This study was approved by the Institutional Review Board of Hospital A (Approval No. 2023419). Participants received a written explanation of the study’s purpose and procedures, emphasizing voluntary participation and anonymity. Those who agreed accessed the survey via a URL included in the invitation letter. Upon

accessing the Google Forms page, participants viewed the same explanation again and proceeded to the questionnaire only after providing explicit informed consent. Those who declined were immediately exited from the survey.

Results

Model fit

Confirmatory factor analysis confirmed that the structural model of the CLB identified in Study 1 demonstrated a comparable level of fit in the present sample (CFI = 0.995, SRMR = 0.018, RMSEA = 0.082). These results support the structural validity of the SCLB across independent samples.

Effects of perceived psychological safety on CLB

A multivariate multiple regression analysis was conducted with perceived psychological safety as the independent variable and CLB dimensions as dependent variables (Figure 1), controlling for demographic variables. The overall model fit was satisfactory ($R^2 = 0.532$, Pillai’s trace = 0.670, $p < 0.001$).

Perceived psychological safety in relation to the team leaders was positively associated with Team Management ($\beta = 0.171$, $p = 0.014$), Member Support ($\beta = 0.159$, $p = 0.027$), Initiative-taking ($\beta = 0.182$, $p = 0.015$), Cognition-sharing ($\beta = 0.148$, $p = 0.046$), and Team Orientation ($\beta = 0.210$, $p = 0.003$). Psychological safety in relation to other members was positively related to Initiative-taking ($\beta = 0.181$, $p = 0.039$) and Team Orientation ($\beta = 0.243$, $p = 0.004$). Psychological safety in relation to the team as a whole was not statistically significant for any CLB dimension.

Regarding demographic covariates, gender showed a positive standardized coefficient for Cognition-sharing ($\beta = 0.244$, $p < 0.001$). Years of professional experience positively predicted Team Management ($\beta = 0.179$, $p = 0.003$) and Member Support ($\beta = 0.192$, $p = 0.002$). Team position also affected several CLB dimensions: followers showed negative standardized coefficients for Team Management ($\beta = -0.339$, $p < 0.001$), Direction-giving ($\beta = -0.283$, $p < 0.001$), Member Support ($\beta = -0.238$, $p < 0.001$), Initiative-taking ($\beta = -0.176$, $p = 0.018$), and Team Orientation ($\beta = -0.157$, $p = 0.026$), whereas the effect for subleaders was not significant.

Effects of CLB on work adaptation

A multivariate regression analysis was conducted with CLB as independent variables and work adaptation as the dependent variable, controlling for demographics (Figure 1). The overall multivariate test was significant ($R^2 = 0.286$, Pillai’s trace = 0.302, $p < 0.001$).

For work fulfillment, positive standardized coefficients were found for Initiative-taking ($\beta = 0.318$, $p = 0.003$) and Team Orientation ($\beta = 0.216$, $p = 0.041$). For workload manageability, Team Management had a positive standardized coefficient (β

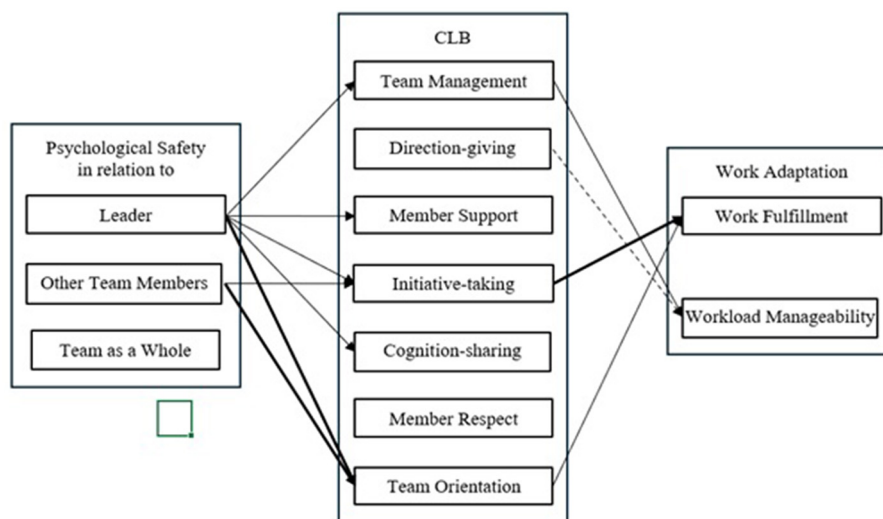


FIGURE 1

Key relations among psychological safety, CLB components, and work adaptation. Left column: Three referents of psychological safety—leader, other team members, and team as a whole. Middle column: Seven CLB components—Team Management, Direction-giving, Member Support, Initiative-taking, Cognition-sharing, Member Respect, and Team Orientation. Right column: Two aspects of work adaptation—work fulfillment and workload manageability. Solid arrows indicate positive standardized paths; dashed arrows indicate negative paths. Thick lines represent effects significant at $p < 0.01$, and thin lines represent effects significant at $p < 0.05$. Only significant paths are shown for clarity.

$= 0.303, p = 0.035$), whereas Direction-giving had a negative one ($\beta = -0.308, p = 0.032$).

Among the demographic covariates, gender negatively predicted both work fulfillment ($\beta = -0.213, p = 0.001$) and workload manageability ($\beta = -0.237, p < 0.001$). In addition, serving as a subleader was negatively associated with workload manageability ($\beta = -0.142, p = 0.040$).

Comparison with the conceptual model of leadership

To examine construct validity, partial correlation analyses were conducted controlling for gender, years of experience, and team position. As shown in Table 4, Team Management and Direction-giving were positively correlated with both transformational leadership ($r = 0.505, p < 0.001$; $r = 0.504, p < 0.001$, respectively) and directive leadership ($r = 0.504, p < 0.001$; $r = 0.448, p < 0.001$, respectively). Member Support and Initiative-taking were positively associated with transformational ($r = 0.469, p < 0.001$; $r = 0.538, p < 0.001$), directive ($r = 0.424, p < 0.001$; $r = 0.436, p < 0.001$), and empowering leadership ($r = 0.302, p < 0.001$; $r = 0.322, p < 0.001$). Cognition-sharing was positively correlated with transformational ($r = 0.429, p < 0.001$) and directive leadership ($r = 0.318, p < 0.001$). Member Respect showed a positive correlation with transformational leadership ($r = 0.348, p < 0.001$) and a negative correlation with aversive leadership ($r = -0.358, p < 0.001$). Finally, Team Orientation was positively correlated with transformational ($r = 0.472, p < 0.001$), directive ($r = 0.349, p < 0.001$), and transactional leadership ($r = 0.304, p < 0.001$).

Comparison with leadership and teamwork competency scales

Partial correlations controlling for gender, experience, and team position (Table 4) revealed that Team Management and Direction-giving were positively correlated with performance guidance ($r = 0.523, p < 0.001$; $r = 0.533, p < 0.001$), relationship building ($r = 0.331, p < 0.001$; $r = 0.322, p < 0.001$), and problem solving ($r = 0.404, p < 0.001$; $r = 0.401, p < 0.001$). Member Support was positively related to performance guidance ($r = 0.415, p < 0.001$) and relationship building ($r = 0.332, p < 0.001$). Initiative-taking showed positive correlations with performance guidance ($r = 0.445, p < 0.001$), relationship building ($r = 0.329, p < 0.001$), fairness and equity ($r = 0.307, p < 0.001$), and problem solving ($r = 0.358, p < 0.001$). Cognition-sharing correlated positively with performance guidance ($r = 0.312, p < 0.001$). Member Respect was associated with relationship building ($r = 0.304, p < 0.001$) and fairness and equity ($r = 0.319, p < 0.001$). Finally, Team Orientation showed positive correlations with performance guidance ($r = 0.366, p < 0.001$), relationship building ($r = 0.344, p < 0.001$), and fairness and equity ($r = 0.349, p < 0.001$).

These results collectively indicate that the SCLB dimensions are consistent with theoretically corresponding leadership competencies and provide evidence for construct validity (convergent and discriminant). Consistent with our a priori expectations, task-oriented dimensions such as Team Management and Direction-giving correlated more strongly with Performance Guidance ($r = 0.523$ and 0.533 , respectively) than with relationship-oriented competencies (e.g., Relationship Building; $r = 0.331$ and 0.322). Overall, correlation magnitudes varied meaningfully by subfactor (i.e., were non-uniform across domains), a pattern that is less

TABLE 4 Partial correlations between SCLB dimensions and existing leadership and teamwork scales.

<i>d f</i> = 244	Statistic	Team Management	Direction-giving	Member Support	Initiative-taking	Cognition-sharing	Member Respect	Team Orientation
Transformational	<i>r</i>	0.505	0.504	0.469	0.538	0.429	0.348	0.472
	<i>t</i>	9.294	9.266	8.437	10.143	7.541	5.900	8.497
	<i>p</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Directive	<i>r</i>	0.504	0.448	0.424	0.436	0.318	0.145	0.349
	<i>t</i>	9.256	7.949	7.442	7.681	5.318	2.333	5.917
	<i>p</i>	0.000	0.000	0.000	0.000	0.000	0.020	0.000
Transactional	<i>r</i>	0.263	0.286	0.256	0.244	0.169	0.291	0.304
	<i>t</i>	4.320	4.743	4.199	3.991	2.714	4.821	5.060
	<i>p</i>	0.000	0.000	0.000	0.000	0.007	0.000	0.000
Aversive	<i>r</i>	-0.003	-0.043	-0.093	-0.075	-0.191	-0.358	-0.214
	<i>t</i>	-0.055	-0.683	-1.489	-1.197	-3.091	-6.084	-3.474
	<i>p</i>	0.957	0.496	0.138	0.232	0.002	0.000	0.001
Empowering	<i>r</i>	0.337	0.280	0.302	0.322	0.196	0.224	0.271
	<i>t</i>	5.689	4.626	5.024	5.404	3.169	3.654	4.474
	<i>p</i>	0.000	0.000	0.000	0.000	0.002	0.000	0.000
Performance Guidance	<i>r</i>	0.523	0.533	0.415	0.445	0.312	0.194	0.366
	<i>t</i>	9.736	9.991	7.243	7.885	5.207	3.136	6.240
	<i>p</i>	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Relationship Building	<i>r</i>	0.331	0.322	0.332	0.329	0.215	0.304	0.344
	<i>t</i>	5.566	5.404	5.588	5.536	3.489	5.074	5.807
	<i>p</i>	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Fairness and Equity	<i>r</i>	0.286	0.297	0.262	0.307	0.261	0.319	0.349
	<i>t</i>	4.741	4.942	4.316	5.122	4.297	5.339	5.913
	<i>p</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Problem Solving	<i>r</i>	0.404	0.401	0.263	0.358	0.275	0.194	0.275
	<i>t</i>	7.003	6.945	4.332	6.078	4.539	3.131	4.533
	<i>p</i>	0.000	0.000	0.000	0.000	0.000	0.002	0.000

Gender (male, female), years of professional experience (<1year, ≤2years, ≤5years, ≤9years, ≤19years, ≤29years, ≤30 years), subleader status (yes, no), and follower status (yes, no) were entered as control variables in the analysis.

consistent with a uniformly high, method-driven association. Taken together, these correlation patterns provide construct- validity evidence for the SCLB in terms of both convergent and discriminant aspects.

Discussion

Regarding the effects of perceived psychological safety on CLB, the results indicated that members who perceived higher psychological safety in relation to their leaders were more likely to engage proactively in situational understanding, coordination, and team decision-making, thereby exerting positive influence on the team as a whole. In healthcare settings, where strong interprofessional hierarchies and traditional authority structures persist, members often experience psychological barriers to

enacting leadership themselves (Edmondson, 1999). To alleviate such barriers, formal leaders are encouraged to adopt servant leadership (Greenleaf, 1977), Appreciative Inquiry (AI)-based leadership (Whitney and Trosten-Bloom, 2010), and humble leadership (Owens and Hekman, 2012). The integration of these leadership styles is expected to facilitate the practice of collective leadership by enhancing the openness and inclusivity of team interactions.

Furthermore, members who experienced psychological safety in relation to their other members were more likely to take initiative, engage in self-directed problem solving, and act in alignment with the overall direction of the team. This finding suggests that mutual trust among professionals—a critical condition in multidisciplinary healthcare teams—may serve as a prerequisite for the expression of CLB. Conversely, perceptions of psychological safety in relation to the team-as-a-whole level did not

significantly predict CLB. This pattern may reflect a hierarchical influence structure of psychological safety: trust perceptions within proximal dyadic relationships (e.g., leader–member or peer-to-peer) directly influence behavior, whereas team-level psychological safety may operate as a higher-order emergent property arising from lower-level interactions.

With respect to work fulfillment, individuals who engaged proactively in their duties and acted with a strong orientation toward team goals reported greater role awareness and, consequently, higher job satisfaction. Regarding workload manageability, those who engaged in Team Management behaviors may have been able to monitor and coordinate overall workflow, including their own tasks, thus reducing perceived overload. In contrast, individuals who frequently engaged in Direction-giving behaviors—clarifying goals and providing guidance—might have experienced greater responsibility and expectations from others, which could increase perceived workload; furthermore, it is possible that high-pressure situations necessitating frequent Direction-giving also inherently reduce perceived manageability.

The SCLB developed in Study 1 demonstrated significant positive relationships not only with theoretically relevant leadership constructs but also with a range of positive organizational variables. Given that the SCLB conceptualizes leadership broadly as “behaviors that positively influence the team and its members” (Bass, 1960), these widespread associations provide strong evidence that the SCLB functions as expected within its nomological network, supporting its construct validity. Constructs such as psychological safety (Edmondson, 1999), teamwork (Kozlowski and Ilgen, 2006), and team performance (Mathieu et al., 2019) are key indicators of team effectiveness in modern organizations, all of which are promoted through positive interpersonal interactions (Uhl-Bien, 2006; West et al., 2014). The SCLB, by measuring leadership as enacted behavior, captures precisely these positive, relational influence processes that underlie effective team functioning. Therefore, the broad positive associations observed between the SCLB and various organizational variables indicate that the scale functions appropriately within its conceptual domain and successfully identifies behavioral patterns that contribute to team effectiveness from multiple perspectives.

Interestingly, in the present study, psychological safety was significantly associated with CLB in relation to leaders and in relation to other members, but not in relation to the team as a whole. This finding suggests that psychological safety may not represent a team-level construct that reflects the overall team mood or climate, but rather a relational-level construct experienced within specific interpersonal relationships. From this perspective, not only leadership—which has been conceptually defined as collective—but also psychological safety can be understood as relational phenomena that emerge from the quality of interactions among members. Accordingly, the observed associations between psychological safety and CLB may reflect shared relational dynamics, rather than aggregated group states. In this sense, concepts such as leadership and psychological safety, traditionally treated as “group dynamics,” may be reconceptualized as collective formations of relational dynamics.

Taken together, these findings demonstrate that the SCLB encompasses and extends conventional leadership constructs, showing that CLB promote member-driven influence behaviors through their systematic associations with perceived psychological safety. This provides empirical support for the theoretical foundation that operationalizes collective leadership at the behavioral level. By identifying observable influence behaviors that mediate between individual-level perceptions (such as psychological safety) and the emergent leadership of the team as a whole, this study expands the behavioral microfoundations perspective of collective leadership and advances understanding of how collective influence is co-created in practice.

General discussion

Collective leadership behaviors and their structure

Recent leadership research has increasingly shifted toward relational and collective approaches that emphasize interactions among team members rather than the traits or actions of a single leader (Denis et al., 2012; Raelin, 2016). The present study sought to operationalize collective leadership—one of the most advanced approaches within the overarching framework of plural leadership—at the behavioral level by identifying the concrete actions through which team members exert positive influence on one another, regardless of hierarchical position or professional role. Through this effort, we conceptualized and empirically validated the structure of CLB.

The findings extend beyond the traditional framework of shared or distributed leadership, which focuses primarily on the distribution or sharing of formal influence functions, by providing a theoretical perspective that integrates the diverse forms of influence behaviors occurring among all team members. This relational, structural, and behavioral orientation offers a new vantage point for leadership and teamwork research, suggesting that the integration of membership and fellowship perspectives within the broader collective leadership paradigm can contribute to the development of more realistic and effective team-support models.

Beyond linking behavioral and relational approaches, this study further conceptualizes collective leadership as a relational–behavioral loop—a dynamic cycle in which members’ behaviors continuously create, reinforce, and are shaped by interpersonal relationships. Through repeated exchanges of influence and response, these loops generate the collective patterns of direction, alignment, and commitment that characterize leadership at the team level. In this sense, collective leadership is not merely a summation of individual actions or static relational states, but a continuously evolving system of behavioral interactions and relational feedback that sustains the functioning of the team.

Empirically, the results substantiate the idea that leadership is not an attribute of particular individuals or positions but rather a relational phenomenon that emerges through ongoing social interactions among team members—an idea central to collective leadership. The CLB identified in this research complement existing notions of shared and distributed leadership while making visible

the generative and behavioral microfoundations of collective leadership. The resulting Collective Leadership Behaviors Scale (SCLB) enables the measurement of behaviors that can be enacted by all members, even within highly hierarchical organizations. Accordingly, the scale is applicable not only to traditional hierarchical structures but also to flat organizations and project-based teams.

Because the SCLB employs a self-assessment format, it also encourages individuals to reflect on how their own behaviors influence the team. Practically, the instrument can be used at the individual level for self-awareness, competency development, and career planning, and at the team level for understanding complementarity in composition and improving the overall coverage of collective leadership functions. Aggregated data can further be used to visualize the team profile of CLB domains within a team, supporting diagnostic and developmental efforts in organizational and team-building contexts.

From a practical standpoint, the identification of multiple CLB factors that sustain collaboration even in organizations characterized by high specialization and professional hierarchy holds significant value. In healthcare teams, for instance—such as those in acute care or operating room environments—rapid decision-making under a clear command structure is essential, yet information sharing and mutual support are equally critical for maintaining safety. In such contexts, leaders' enactment of social-oriented leadership behaviors that enhance psychological safety, together with members' membership and fellowship behaviors that promote lateral support, are likely to enhance team adaptability and resilience.

Moreover, by aggregating CLB scores at the team level, organizations can assess the team-level pattern and sufficiency of collective leadership behaviors as collective properties of the team. Such data could serve as diagnostic tools for organizational development and team-building interventions. Thus, this study offers a theoretical framework that integrates the behavioral foundations and social emergence of collective leadership, bridging empirical research and practical application in the study and facilitation of collective leadership.

Toward the realization of collective leadership in hierarchical organizations

The healthcare setting examined in this study is traditionally characterized by a strong hierarchical structure, in which physicians typically assume top-down leadership roles (Essex et al., 2023; Nembhard and Edmondson, 2006; Hughes and Salas, 2013). In such organizations, realizing collective leadership requires cultural and organizational transformation at the ground level. To foster a culture of high-quality and safe care, reliance on a single, fixed leader should be complemented by interactional routines through which physicians, nurses, pharmacists, physical therapists, and other professionals dynamically co-create leadership in interaction according to situational demands (West et al., 2014). This form of interprofessional collaboration can contribute to faster decision-making, more effective information sharing, and

the reduction of medical errors. The Collective Leadership Behaviors Scale (SCLB) developed in this research provides a means to measure the influence behaviors that underlie such coordination, collaboration, and joint decision-making among diverse professional groups.

Although the present study focused on teams within medical organizations, several challenges remain for the practical realization of collective leadership in healthcare teams. Medical environments often require immediate responses and rapid decision-making. Consequently, many healthcare organizations deliberately maintain a hierarchical chain of command to ensure clarity in authority and communication. For this reason, the introduction of interactionally enacted collective leadership must be approached with careful consideration. One potential solution involves balancing clearly defined role differentiation with flexible decision-making processes at the institutional level. For example, during emergency surgery, physicians must make final decisions as formal leaders; however, collective leadership can be cultivated by ensuring that nurses, anesthesiologists, and other team members are equipped and empowered to exercise professional judgment at appropriate moments (Kalisch and Lee, 2010).

In everyday practice, creating opportunities for each team member to take initiative—such as facilitating discussions or leading case conferences—can also promote collective leadership. Many hospitals already implement initiatives that rotate facilitation roles among less experienced staff members, encouraging active participation and confidence building. Nevertheless, the essence of the collective leadership approach lies in voluntary enactment rather than assigned rotation. To make this possible, formal leaders must adopt member-supportive leadership behaviors that enhance psychological safety and create a team climate where followers feel encouraged to act autonomously. At the same time, individual staff members must develop the skills and self-efficacy required to enact collective leadership behaviors proactively, irrespective of their formal position.

We address unit/department differences and potential links to quality/safety outcomes because healthcare provides an information-rich field setting: work is tightly interdependent, roles are differentiated, and coordination demands are frequent and consequential, all of which make CLB more observable in routine collaboration. At the same time, our intent is not to develop a healthcare-specific instrument. Instead, we treat healthcare as an initial empirical testbed for eliciting and validating a behavioral repertoire of collective leadership that should extend to other interdependent teams; its generalizability should be examined through replication in diverse organizational settings.

Implications for leadership development

The results of this study suggest that fostering collective leadership requires the cultivation of awareness and practical competence in influence behaviors at all organizational levels. The CLB framework provides a practical foundation for members to engage in self-reflection and to intentionally enact influence behaviors that contribute to the team's direction, alignment, and

commitment. Moreover, the SCLB serves as a diagnostic tool to assess behavioral balance within teams and can be applied to support leadership education and organizational development. From an applied perspective, the SCLB can be used not only as an outcome measure but also as a structured reflection and feedback tool for interprofessional teams. For example, teams can periodically review their SCLB profiles (overall and by the seven behavioral domains) to identify behavioral gaps (e.g., strong relationship building but weaker Team Management), set concrete behavioral goals for the next work cycle, and revisit progress in subsequent debriefings. This approach helps teams move beyond generic calls for “teamwork” and instead select brief, behavior-focused practices aligned with specific CLB domains (e.g., structured speaking-up prompts, cross-professional check-backs, and brief, facilitated case huddles). This may be particularly relevant in settings where rapid coordination across professions is critical for patient safety. Importantly, these examples are intended as practical guidance for reflection and development; rigorous tests of CLB-based interventions remain a priority for future research.

Accordingly, leadership development and training programs should aim to enhance collaborative alongside formal hierarchical leadership capabilities by fostering psychological safety and mutual influence among members. Such initiatives would not only develop individual competencies but also strengthen collective functioning through collective accountability and reciprocal influence. In doing so, this framework bridges the gap between the theoretical microfoundations of leadership and the practical development of collective leadership behaviors in real organizational contexts.

This distinction also clarifies the contribution of the present work relative to distributed/distributive models. Whereas distributed leadership research often foregrounds how leadership functions are allocated across actors and structures, our contribution is to specify the behavioral micro-units through which DAC is generated in interaction within differentiated roles. By identifying concrete behaviors that any member can enact, we provide a more granular account of how leadership emerges as a collective social process rather than as only a redistribution of authority or tasks. In doing so, we extend prior field research that operationalized collective leadership as the collective enactment of leadership roles and linked it to team effectiveness (Hiller et al., 2006) by (a) specifying a finer-grained behavioral repertoire organized hierarchically and (b) situating these enactments within relational safety processes that may operate more proximally at the leader–member and peer-to-peer level in hierarchical healthcare teams.

Limitations and future directions

Several limitations of this study should be acknowledged. First, the measurement of CLB was based on cross-sectional self-assessment data, which may be subject to cognitive bias and temporal effects. Future studies should employ multi-source analyses that integrate self-ratings with peer evaluations and behavioral observations to more rigorously validate the behavioral authenticity of CLB.

Second, because the sample in this study was drawn from Japanese healthcare organizations, the generalizability of the CLB structure and effects may be bounded by cultural and institutional conditions, including professional hierarchies and high-context communication. Future research should therefore examine replication across countries and industries and test whether cultural values such as power distance and collectivism moderate how CLB is enacted. Cross-cultural comparative designs—contrasting contexts where horizontal collaboration is more institutionally embedded with those where authority gradients are steeper—would help clarify which components of collective leadership are universal vs. context-specific.

Finally, from an applied perspective, the implementation of CLB-based interventions represents an important direction for future research. The CLB scale can serve not only as a self-reflective tool for individuals to assess their own leadership behaviors but also as a diagnostic instrument to visualize team-level strengths and imbalances. Future studies should design and empirically test leadership development programs or feedback-based interventions grounded in CLB. In particular, constructing practical frameworks that enhance psychological safety while activating influence behaviors across all members will be key to advancing collective leadership research from theoretical refinement to organizational transformation.

Conclusion

This study identified the Collective Leadership Behaviors (CLB) that constitute the behavioral microfoundations of collective leadership and developed and validated the Collective Leadership Behaviors Scale (SCLB), which measures the influence behaviors that can be enacted by all team members. Across two studies conducted in healthcare organizations—settings characterized by high reliability and hierarchical structure—CLB were found to comprise four higher-order and seven lower-order factors. Building on this structural foundation, the analyses revealed that the SCLB captures behaviorally specified influence processes that covary with both relational safety perceptions and adaptive work functioning. Specifically, perceived psychological safety—particularly in relation to leaders and peers—was associated with several CLB domains, and multiple CLB domains, which were, in turn, associated with work adaptation. This pattern is consistent with the view that collective leadership is instantiated in members’ enactable influence behaviors that are intertwined with relational safety processes and adaptive functioning at work.

Practically, the SCLB provides a framework for visualizing and developing behavioral and relational resources across all members, even within highly specialized and hierarchical teams. Future research should build on this relational conceptualization by adopting longitudinal and multi-source (e.g., self-, other-, and observational) designs to capture how collective leadership behaviors emerge, evolve, and recursively shape team adaptation and learning over time. Such approaches would clarify the dynamic mechanisms through which CLB is co-created, sustained, and transformed in real workplace contexts.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Kansai Medical University Ethics Committee (Hospital A; Approval No. 2023419, Osaka, Japan) and Chukyo Hospital Ethics Committee (Hospital B; Approval No. 2023021, Nagoya, Japan). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MF: Validation, Conceptualization, Data curation, Methodology, Writing – review & editing, Supervision, Writing – original draft, Visualization, Formal analysis. MS: Writing – review & editing, Visualization, Data curation, Validation, Investigation. HM: Writing – review & editing, Methodology, Investigation, Supervision, Validation.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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