RESEARCH INSIGHTS

Climbing to Peak Team Effectiveness with CCL's TeamVantage™ Assessment

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Executive Summary

In the journey of team development, the path to success can be likened to climbing a mountain. Just as climbers rely on tools and guides to navigate the terrain, teams can benefit from assessments like CCL's TeamVantage™ to chart their course towards team effectiveness. In this paper, we draw upon data from over 480 senior leaders and their teams to consider how TeamVantage serves as a crucial guide in helping them to identify and enhance outcomes of leadership, like Direction – Alignment – Commitment (DAC)™, pursue greater team-level results such as better performance and satisfaction, and understand key social processes as they ascend towards peak effectiveness.

By focusing on the team, TeamVantage captures nuanced layers of effectiveness that exist between team member's unique experiences and the broader organizational culture. This level of analysis is essential for understanding the complex interplay of factors that influence team effectiveness. In fact, our research provides 4 key findings for leaders to consider.

First, psychological safety emerged as a dominant predictor of all three outcomes of leadership (i.e., direction, alignment, and commitment). Teams that cultivate a climate of psychological safety consistently reported clearer direction, greater alignment among team members, and stronger commitment to the group. This reinforces the importance of fostering an environment where team members feel safe to take risks. So, before even setting off from basecamp, leaders should ensure that their team members can express themselves without fear of negative consequences.

Second, we also found that several other qualities of a group (e.g., cultivating a strong identity, managing conflict) can compliment the benefits of psychological safety when predicting outcomes of leadership. Thus, throughout their ascent, a combination of factors will likely help a team attain reach its objectives.

Third, as one might expect, the social processes that unfold within teams can take on different forms. In fact, we identified three distinct patterns of influence that largely reflect either partnerships among pairs of team members, broader collaboration among the entire team, or reliance on one or two prominent sources of influence. Our data suggests that these patterns can yield distinct outcomes, but the effectiveness of each approach may also depend on external factors such as the prevailing business need or organizational culture.

Fourth, the outcomes of leadership each uniquely predict different aspects of team effectiveness. Direction is linked to thriving, alignment correlates with performance and satisfaction, and commitment is associated with learning. To reach the peak of their intended summit, leaders and their teams benefit by striving for all three leadership outcomes and not prioritizing one at the expense of another.

From these findings, we offer four questions for leaders to ask about their own team (see Figure E1). By answering these questions, and understanding how their teams measure up in these areas, leaders can better prioritize their development efforts. Focusing on the effectiveness of a leader's current team is invaluable for both the leader and the group's development. CCL's TeamVantage assessment provides this perspective, offering insights that can guide teams on their journey to peak performance.

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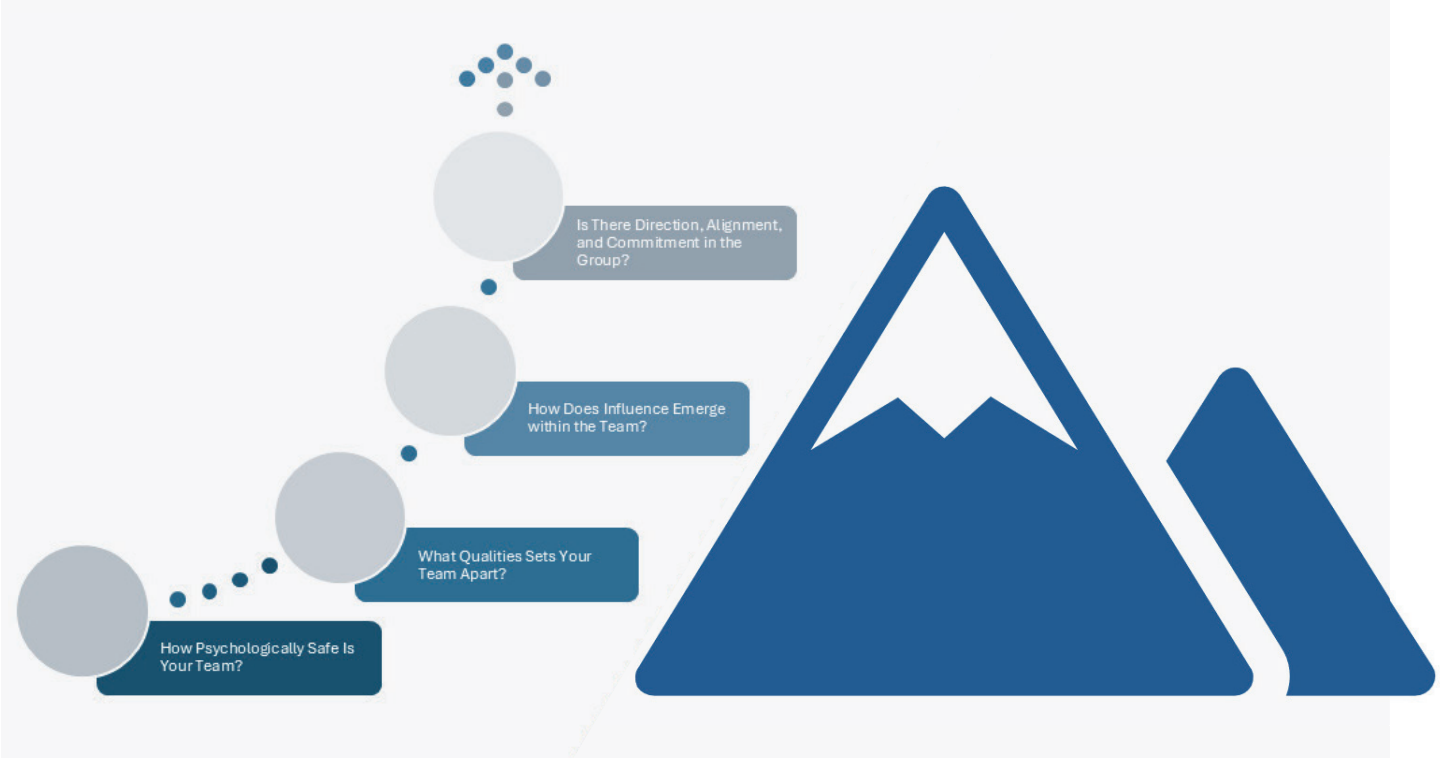
POWERFUL QUESTIONS TO CONSIDER ON YOUR JOURNEY TO TEAM EFFECTIVENESS



Note. Questions are based on our four key findings from our analysis of data collected using CCL's TeamVantage assessment based on over 480 senior leadership teams.

FIGURE E1

Climbing to Peak Team Effectiveness with CCL's TeamVantage™ Assessment

Imagine attempting to summit Mount Everest. Though others have come before you, the journey is long, treacherous, filled with unpredictable weather, steep inclines, scary crevasses, and poses the constant threat of setbacks. Still, only two-thirds of those who attempt such a feat succeed, and absolutely none do it alone. Consider all the roles necessary to complete such an accomplishment. Sponsors provide resources, experienced guides offer their invaluable expertise, sherpas carry the equipment, and climbers make adjustments in real time based on conditions during the climb. This adventure, marked by its successes and setbacks, demands patience, preparation, and a clear understanding that reaching the summit is a gradual and collaborative process.

In many ways, leading a team in today's organizational landscape takes on a similar form. Organizations increasingly resemble a "teams of teams" structures where groups come together to achieve collective outcomes (Devine et al., 1999; Hollenbeck et al., 2012). Nowhere is this more evident than within the upper echelons of today's organizations, where top management and senior leadership teams bring together diverse individuals representing various business functions. Leaders of these executive teams must cultivate environments where members clearly understand their collective objectives, ideas are openly shared and safely challenged, and relationships benefit the entire team (Carpenter et al., 2004; Hambrick & Mason, 1984). Oftentimes, each member of a senior leadership team represents an accomplished, competent, and powerful stakeholder within the organization who leads other teams, departments, or

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functions. Given the importance of team effectiveness among these teams, as well as leaders of all levels, there is immense value in understanding how well one's team operates (Luciano et al., 2020).

Enter CCL's TeamVantage assessment. The name TeamVantage refers to the multiple vantage points leaders gain into their team through this assessment. As a fixture within CCL's Leadership at the Peak (LAP) program, TeamVantage adds tremendous value to a leader's and their team's insights for development. Although leadership assessments often focus on the individual (Leslie & Braddy, 2015) or provide feedback about the entire organization (McCauley & Fick-Cooper, 2019), TeamVantage targets a leader's whole team. In covering topics related to team effectiveness, culture, Direction – Alignment – Commitment (DAC)™, and patterns of relationships within the team—whether it be their direct reports, a task force, or a sprint team — TeamVantage captures the nuanced, hard-to-capture layer that lives in between each individual's experience and an organization's culture (House et al., 1995; Klein & Kozlowski, 2000).

Just as climbers cannot simply wake up and decide to climb Mount Everest solo, leading teams in today's organizations requires a strategic and informed path. TeamVantage provides the necessary insights to help leaders navigate this challenging terrain, ensuring that their teams can reach new heights of performance and collaboration. Drawing upon insights from TeamVantage, we review key findings that can guide a leader and their team towards peak effectiveness and ways in which senior leaders can see how their team compares to others. Taken as a whole, these findings demonstrate the value of TeamVantage as a useful component of a team's developmental journey.

Climbing to Organizational Success Through Leadership and Team Effectiveness

At the Center for Creative Leadership (CCL), we define leadership as a social process (McCauley & Fick-Cooper, 2019; McCauley & Palus, 2021), which when done well, results in three distinct, yet interrelated, outcomes: direction, alignment, and commitment (see Figure 1, following page). Direction refers to a shared understanding and agreement on the overall goals, aims, and mission within a group. Alignment involves organizing and coordinating knowledge and work effectively within the group. And commitment is the willingness of group members to prioritize the collective interests and benefits over their individual interest (Drath et al., 2008).

To illustrate, let's revisit Mount Everest. For everyone to survive and summit the mountain, each person in the expedition needs to agree upon the expedition's strategy and timeline. Likewise, there should be clarity around group members' roles and contribution to ensuring everyone makes it to the summit safely and efficiently. Lastly, there must be a sense of mutual obligation and willingness to sacrifice one's personal agenda for the collective.

Mountaineering expeditions may be an extreme example, but they are just like any other team in that group qualities and dynamics significantly influence how the social process of leadership unfolds and, in turn, generates the desired key outcomes of DAC (Figure 1, following page).

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FRAMEWORK FOR DIRECTION, ALIGNMENT, COMMITMENT MODEL OF LEADERSHIP

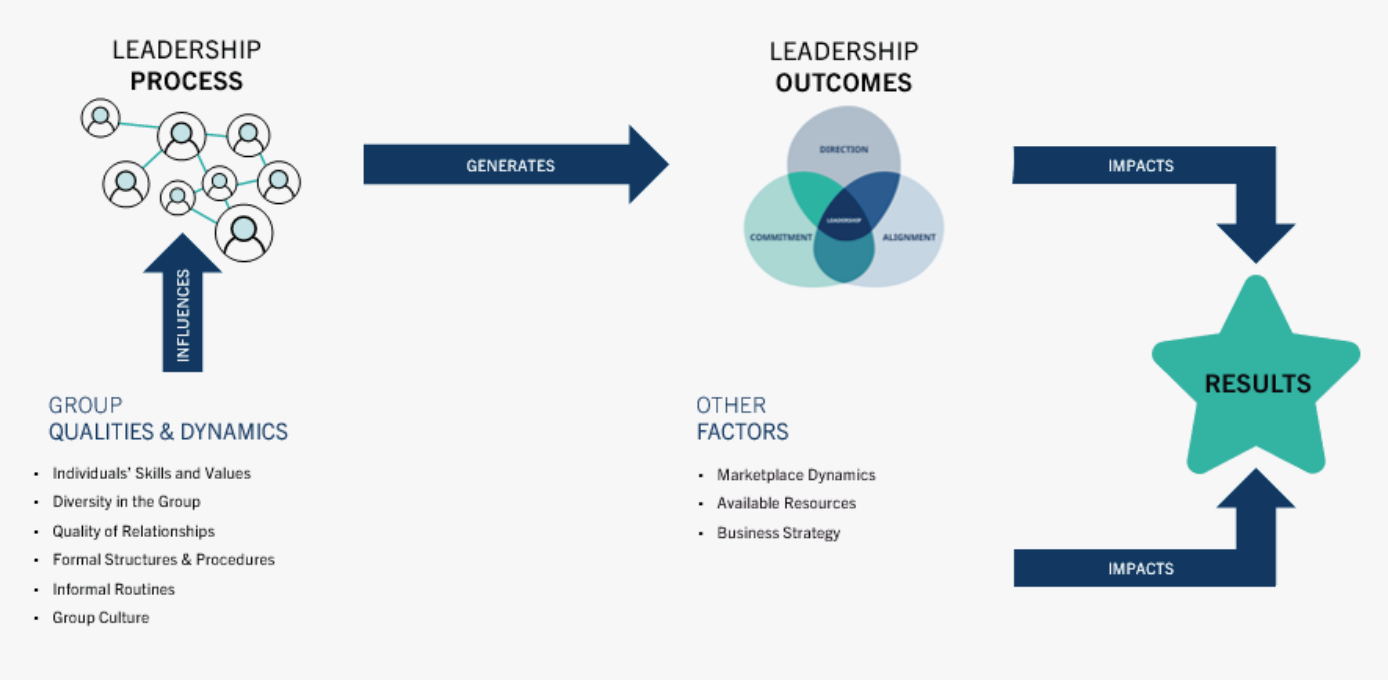

FIGURE 1

How Do Group Dynamics Predict DAC?

The data collected from our TeamVantage study is drawn from over 450 senior leaders who attended LAP and identified a team that they led and wanted more feedback about.[1] Our analysis looked at specific team dynamics and processes: the presence of a collective team identity, the tendency to adopt and defend the team's identity, information sharing, psychological safety, task conflict, and relationship conflict (for a summary, please see Table 1, following page). Each of these constructs are thought to be key components of cultivating an effective team (Loignon et al., 2022). Our findings showed that each group quality provided distinct information when predicting a team's overall levels of DAC.

To identify which factors are most important, we conducted an analysis to determine the strongest predictors of DAC (see Figure 2, following page). Our analysis revealed consistent patterns. Most group qualities examined, except for defending the team's identity, significantly predict these three outcomes of leadership. In other words, each factor explained at least 20% of the variation in DAC. Such values represent relatively large relationships compared to prior studies (Bosco et al., 2015). This suggests that several team qualities can predict higher levels of DAC.

For example, having a strong collective identity (team members seeing themselves as part of the group) and experiencing less relationship conflict (fewer personality clashes within the team) are associated with higher DAC.

That said, psychological safety emerged as a particularly potent predictor of DAC. This aspect of a senior leadership team was the strongest unique predictor of both commitment (31%) and alignment (24%), which suggests that one could predict, with surprising accuracy, a team's commitment and alignment from just knowing the group's psychological safety. Thus teams whose team members feel safe to share ideas, challenge one another's opinions, and express themselves freely are expected to report higher levels of alignment and commitment. This highlights that psychological safety is not just a "nice-to-have" but a powerful pathway for achieving the leadership outcomes that team leaders often aim for (Frazier et al., 2017).

Additional group qualities also emerged as potent predictors of the outcomes of leadership. Task conflict negatively predicts DAC and is one of the stronger predictors of direction (24%) and alignment (24%) among those examined. This means that teams

[1] Details about the sample, our methods, and our analyses can be found in Appendix A.

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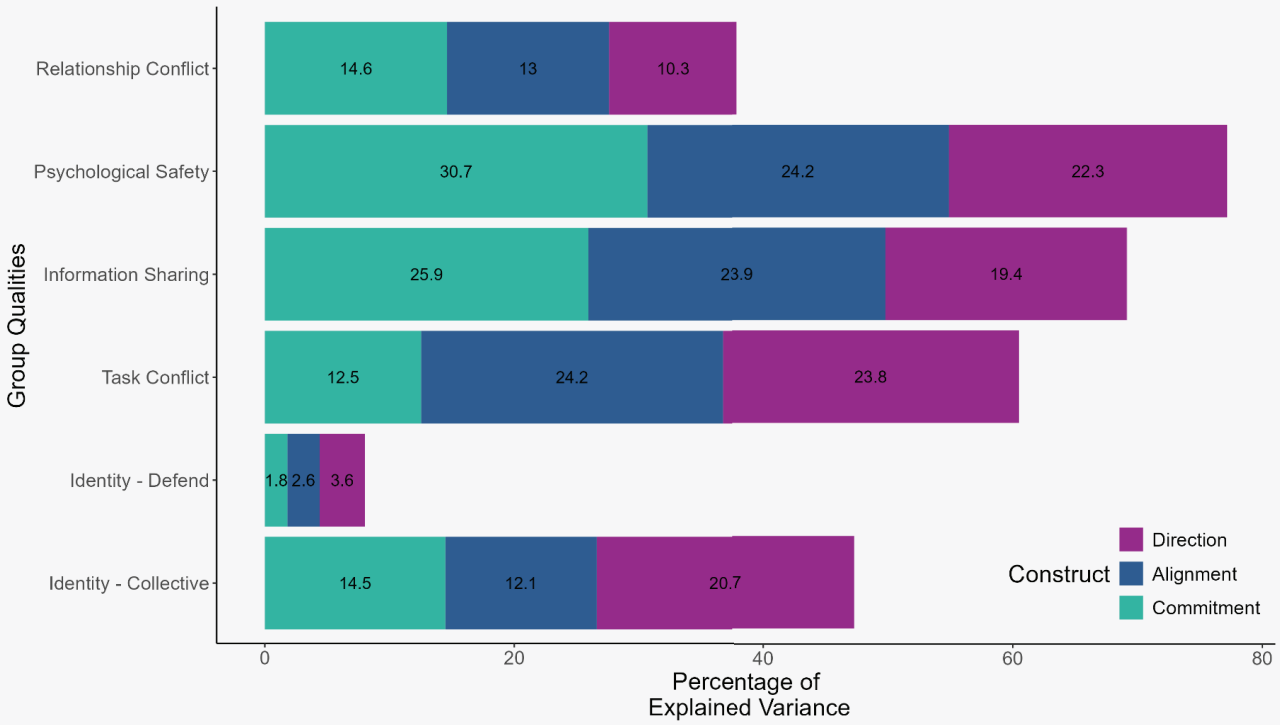
with more conflict about executing or prioritizing tasks tend to struggle with determining the team's objective and how to execute or prioritize a goal. This finding aligns with previous research showing that disagreements about ideas and processes can harm team performance (de Wit et al., 2012). We can also see that information sharing is a consistent predictor of all three outcomes of leadership (19% to 26%). This finding further highlights the value of having team members elaborate on what unique information they know (Mesmer-Magnus & DeChurch, 2009).

SUMMARY OF GROUP QUALITIES CAPTURED VIA TEAMVANTAGE AND FEATURED IN THIS RESEARCH

Group Quality	Definition
Identity – Collective	The degree to which team member's see themselves as a member of the team (Ashforth & Mael, 1989).
Identity – Defend	The degree to which team members would defend their team (Ashforth & Mael, 1989).
Task Conflict	An awareness of differences in viewpoints and opinions pertaining to a group task. Similar to cognitive conflict, it pertains to conflict about ideas and differences of opinion about the task (de Wit et al., 2012; Jehn, 1997).
Information Sharing	Processes by which team members determine which information is shared and unique among its team members and deliberately exchange work-related information and discuss ongoing taskwork (Mesmer-Magnus & DeChurch, 2009)
Psychological Safety	Team psychological safety is defined as a shared belief that the team is safe for interpersonal risk taking (Edmondson, 1999)
Relationship Conflict	An awareness of interpersonal incompatibilities includes affective components such as feeling tension and friction. Relationship conflict involves personal issues such as dislike among group members and feelings such as annoyance, frustration, and irritation (de Wit et al., 2012; Jehn, 1997).

TABLE 1

GROUP QUALITIES PROVIDE DIFFERENTIAL PREDICTION OF DIRECTION, ALIGNMENT, COMMITMENT



Note. Data are based on 489 senior leadership teams. Total height of a bar represent the extent to which a group quality predicts leadership outcomes (i.e., DAC), while relative size of each colored segment of a bar represent the unique predictive value for a single outcome of leadership (e.g., Direction vs. Alignment). Additional technical details are provided in Appendix A.

FIGURE 2

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Lastly, a team's collective identity emerged as a particularly strong predictor of the degree to which there is shared direction in the group (21%). Teams where most members see themselves as a member of the group are also more likely to report having a clearer understanding of the team's objectives. This highlights the value of establishing the "core" foundation of one's team shortly after it forms and periodically as the team develops (Loignon et al., 2022).

Returning to the metaphor of a team ascending Mount Everest, these findings point towards the unique value of ensuring every climber identifies with the expedition group, addressing task conflicts around strategies and actions during the ascent, readily sharing each climber's unique knowledge, and fostering psychological safety so that new ideas, routes, and options can be expressed freely without backlash.

How Does DAC Influence Team Effectiveness?

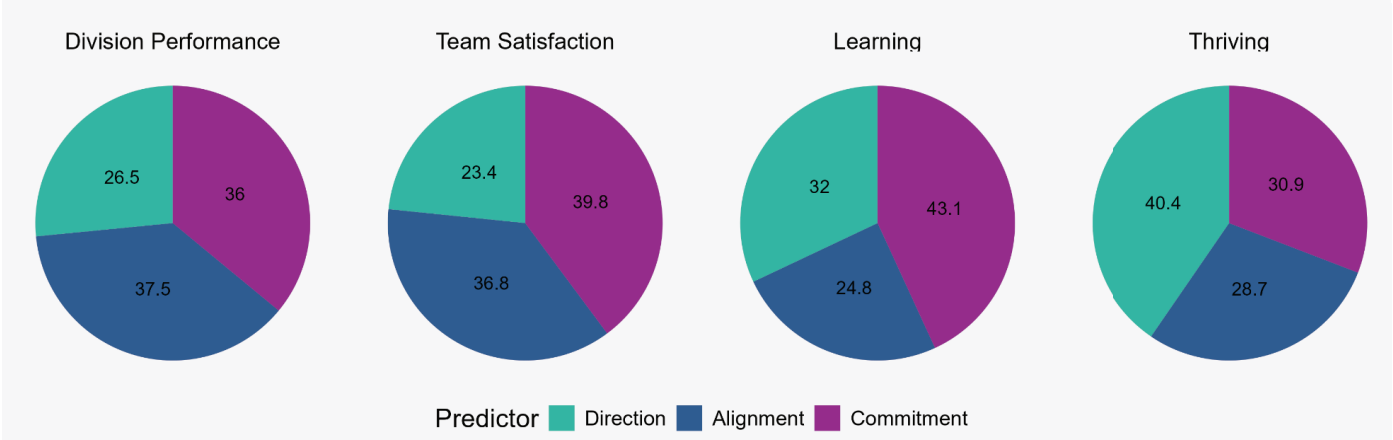
Along with understanding how team dynamics can predict DAC, we also analyzed data from CCL's TeamVantage assessment to examine how a team's level of direction, alignment, and commitment, in turn, predicts the team's effectiveness. In other words, to what extent do the outcomes of leadership (as a social process) shed light on a team's effectiveness? Drawing upon the wealth of information afforded by TeamVantage, our research looked at a range of effectiveness measures (Bell & Marentette, 2011; Hackman, 1987; Tay et al., 2023), including meeting performance objectives within the team's division, team member satisfaction, individual learning experiences, and member thriving—a strong indicator of wellbeing.

Our findings show that DAC captures at least 20% of the variance in each outcome. However, when trying to forecast the results that a team produces, focusing on one aspect of DAC at the expense of others is unwise. Leadership outcomes are holistic (McCauley & Palus, 2021), and different components of DAC influence various measures of team effectiveness differently.

Direction emerged as the strongest predictor of thriving (40% explained variance). Perhaps this result stems from the consistent finding that uncertainty is, itself, unpleasant (Hackman & Oldham, 1976; Hohman et al., 2017). Thus, in teams where members agree upon what should be accomplished, there may be less uncertainty and strain around one's role or efforts in the team.

Additionally, alignment most strongly predicts division performance (38%) and team satisfaction (37%). Typically, achieving a team's objectives and maintaining some level of positive relationships among team members are top-of-mind for a leader (Hackman, 1987). Yet, achieving this alignment is often a place where groups struggle (McCauley & Fick-Cooper, 2019) and is

DIRECTION, ALIGNMENT, COMMITMENT PREDICTS "RESULTS" WITHIN SENIOR LEADERSHIP TEAMS



Note. Data are based on 489 senior leadership teams. Total size of a slice within each piece represents the extent to which DAC provides unique predictive information for a particular measure of team effectiveness. Additional technical details are provided in Appendix A.

FIGURE 3

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sometimes referred to as "process loss" (Steiner, 1972). Slippage in alignment, then, may lead to challenges in meeting objectives and declines in team satisfaction, as task-based struggles can sometimes spread to relationship-based strife (Jehn & Mannix, 2001).

Lastly, commitment emerged as a particularly potent predictor of learning in teams (43%). In some ways, learning may require one to go above and beyond their daily duties and thus reflects what some scholars describe as organizational citizenship behaviors (Bergeron et al., 2013). Further, because commitment may require one to put aside their personal goals for the benefit of the team (McCauley & Fick-Cooper, 2019), this outcome of leadership may then encourage team members to be willing to learn from each other, accept that they may not have the best suggestions or answers, and be open to trying new approaches. Having a strong connection to the team's purpose and objectives may facilitate such additional efforts and a learning-oriented mentality.

If a team's developmental journey is similar to ascending a mountain, these findings point to some well-blazed pathways of reaching the summit (i.e., performance objectives) while maintaining strong relationships among team members (i.e., team satisfaction) and ensuring that team members continue to learn and are thriving. Specifically, cultivating robust leadership outcomes (i.e., DAC) and monitoring such outcomes (through an assessment like TeamVantage) provides leaders with an understanding of where they are on their journey and what new routes they may need to pursue.

Scaling Leadership Heights: Capturing the Process

Leadership is fundamentally a social process, as highlighted in CCL's DAC framework (McCauley & Palus, 2021) (see Figure 1). One way to clearly picture these social processes is through social network analysis (Carter et al., 2015; Cullen-Lester et al., 2016). In this context, networks represent the patterns of influence among a team leader and their teammates as well as between teammates themselves. From this perspective, leadership can be seen as the negotiation of influence among pairs within groups, showing how influence is claimed, granted, and shared collectively (DeRue & Ashford, 2010; Wang et al., 2014).

A network lens, then, captures how leadership essentially unfolds through relationships. It identifies who influences whom and examines the general structure of influence within a team. These structures may be hierarchical, with a leader as the sole influencer, largely shared among team members, or somewhere in between. Each of these structures reflects different types of team dynamics (Carter et al., 2015; Wang et al., 2014).

To capture leadership as a social process in teams, TeamVantage provides leaders with this type of network analysis and visually represents the connections between their members of the network. Within TeamVantage, team leaders and members identify sources of influence. Using these ratings, we can determine the patterns of influence within the team, considering interconnectedness, convergence, and mutual connections.[2] Each of these metrics reveals valuable insights about how influence is structured within a team:

- *Interconnectedness* refers to the proportion of observed connections in a team's network compared to the total possible connections. High-density teams have everyone connected with everyone else, while low-density teams have only a few connections.
- *Convergence* measures the degree to which social interaction in a network is focused on a few central individuals—one or two members serving as the primary go-to people. In teams with lower convergence, connections are more evenly distributed.
- *Mutual connections,* or reciprocity, indicate the extent to which two team members

[2] Those familiar with social network analysis will recognize these terms as being synonymous with measures of density, centralization, and reciprocity (Wasserman & Faust, 1994)

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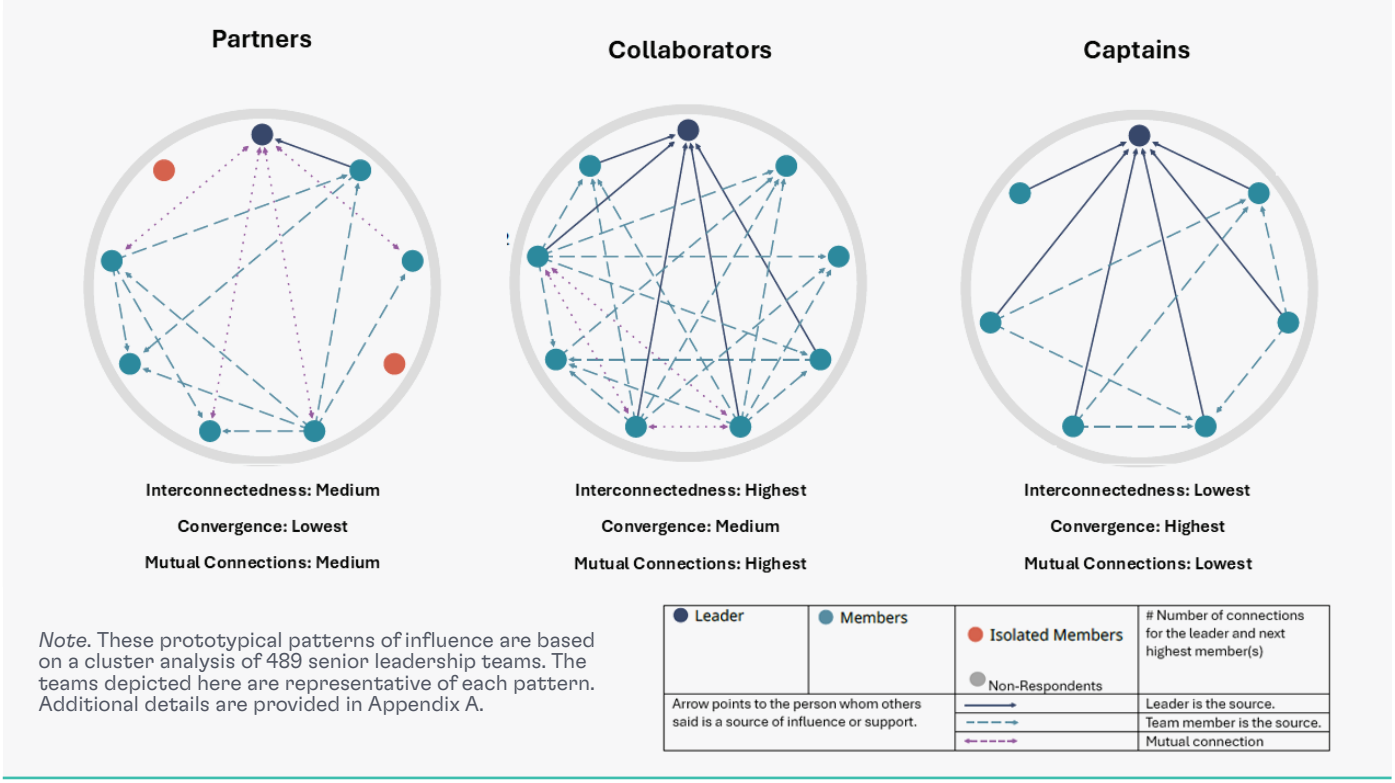
acknowledge each other as a source of influence. For instance, high reciprocity means that if team member A is affords influence to member B, member B is likely to then afford influence to member A. These two members, then, would mutually influence one another.

PROTOTYPICAL PATTERNS OF INFLUENCE FOR VARIOUS CLUSTERS OF SENIOR LEADERSHIP TEAMS



Note. These prototypical patterns of influence are based on a cluster analysis of 489 senior leadership teams. The teams depicted here are representative of each pattern. Additional details are provided in Appendix A.

FIGURE 4

Emerging Patterns During a Team's Ascent

Returning to the TeamVantage data, we performed a cluster analysis that sought to identify "patterns" or "types" of teams based on these three ways of describing their influence network (i.e., interconnectedness, convergence, and mutual connections). These patterns can then be identified, examined, and used to help leaders make critical decisions about how influence is structured in their team.

Our analyses suggest that three patterns of influence networks provide a reasonable representation of the data, and each pattern represented a distinct configuration of influence. After carefully reviewing the nature of these patterns, we've provided the following labels to describe the nature of influence in a senior leadership team: Partners, Collaborators, and Captains.

- **Partners:** This pattern of influence within teams is characterized by a somewhat sparse set of connections where influence is not centralized (i.e., relatively low interconnectedness and convergence). Instead, there are many team members who exhibit reciprocal influence (i.e., elevated mutual connections), which represent situations where leadership emerges primarily among "pairs" of team members.
- **Collaborators:** This pattern of influence represents both the highest levels of interconnectedness and mutual connections in our sample. Thus, this pattern closely resembles what's commonly

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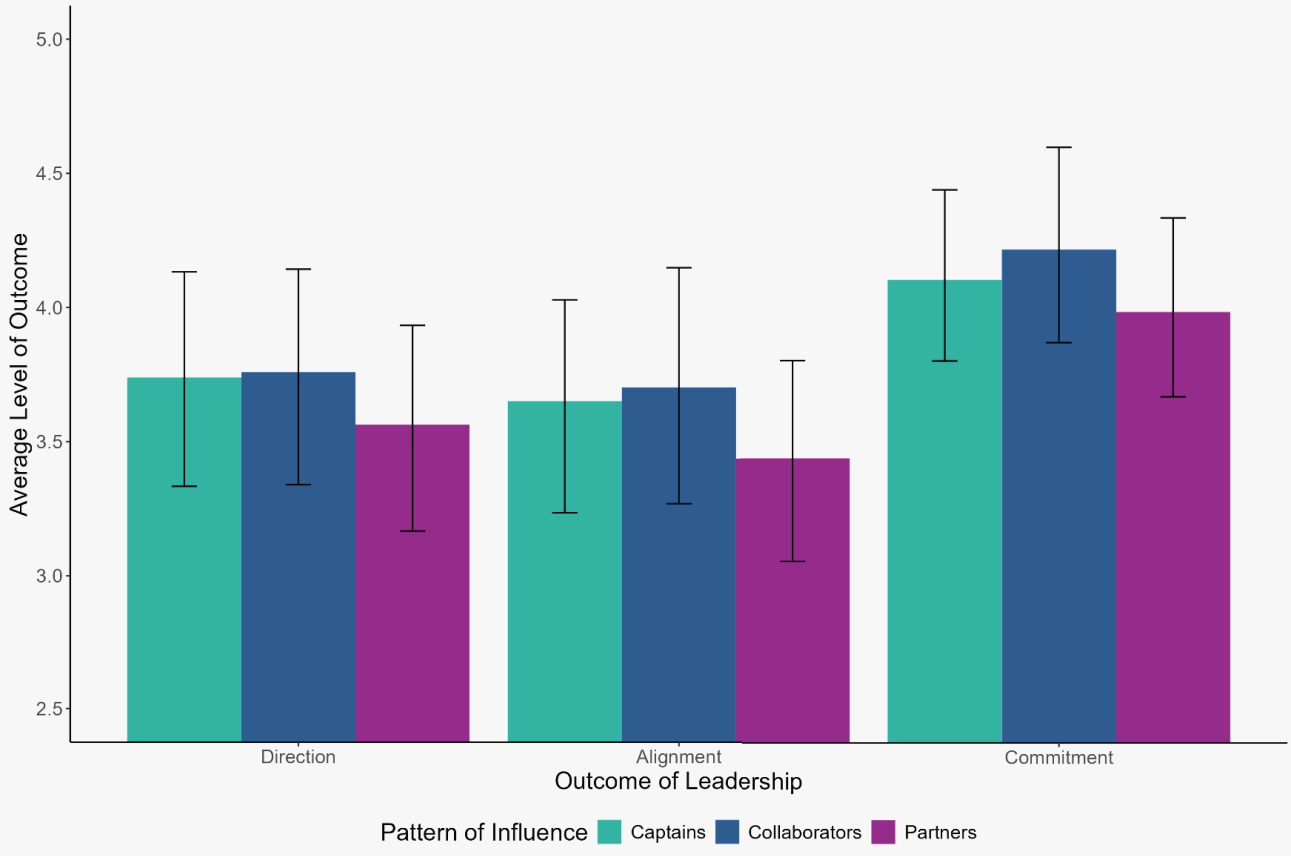
thought of as shared influence, where all team members readily claim and afford influence to one another.

- **Captains:** This pattern of influence is defined by having one or two prominent sources of influence (i.e., relatively high convergence) and minimal reciprocity (i.e., relatively few mutual connections). Thus, the team's influence structure begins to resemble something that may be thought of as hierarchical or vertical in nature (Cullen-Lester & Yammarino, 2016).

Importantly, each of these patterns comprises at least 119 teams in our cluster analysis, which suggests that these clusters are relatively common and not outliers or isolated occurrences. As such, there is a reasonable likelihood that other teams' leadership processes may resemble the social dynamics we've uncovered in this sample.

A key consideration, then, is how team leaders may think of these patterns of influence. Is one pattern more helpful or effective than others? To initially explore such a question, we compared the average level of DAC across teams assigned to a particular pattern of influence (Figure 5). These findings suggest that teams whose influence networks resemble "Captains" or "Collaborators" report significantly higher levels of all three outcomes of leadership when compared to "Partners." Thus, despite the relatively high levels of mutual connections among team members, the nature of influence within "Partners" may be too diffuse and represent subgroups or gaps in how leadership unfolds as a social process. Conversely, teams whose influence relies on "Captains" or "Collaborators" represent

DIFFERENCES IN OUTCOMES OF LEADERSHIP ACROSS PATTERNS OF INFLUENCE



Note. Different color bars correspond to each of the three patterns of influence identified in our analyses (Captains = 188 teams; Collaborators = 182 teams; Partners = 119 teams). Each bar corresponds to the average level of a leadership outcome (direction, alignment, or commitment) for the team assigned to a particular pattern. Error bars correspond to the 20th and 80th percentile within each group. Differences across patterns influence for direction (F (1, 487) = 8.42, p = .003) and alignment (F (1, 487) = 11.05, p = .003) are statistically significant at the $p < .001$ level, while differences for commitment are significant at the $p < .10$ level (F (1, 487) = 3.77, p = .05).

FIGURE 5

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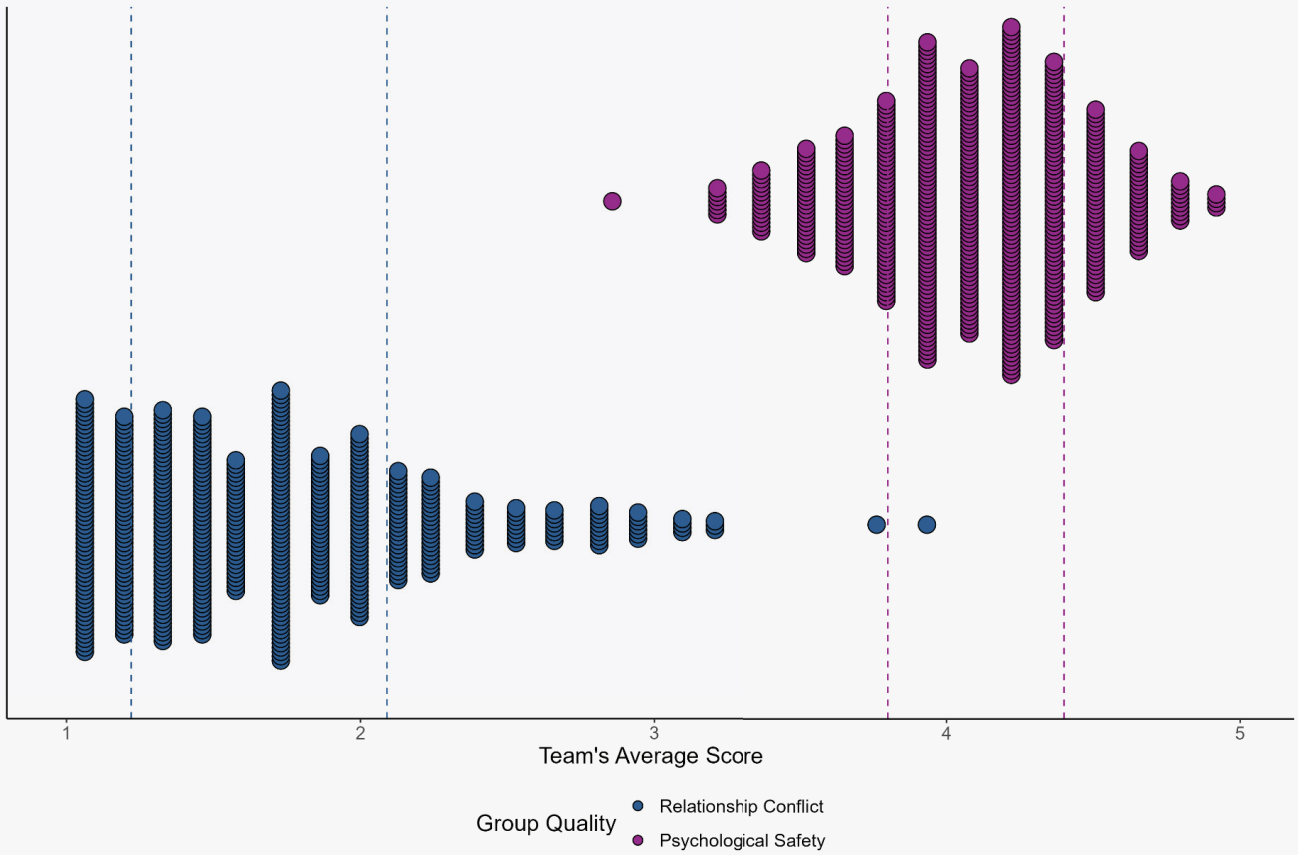
distinct, but equally impactful, forms of leadership.

If leadership is a social process, then the network view provided by TeamVantage may afford a powerful perspective on how influence is structured within a senior leadership team. When ascending their peak during their developmental journey, teams seem to adopt one of three forms when negotiating influence: partnerships among pairs of team members, broader collaboration, or identifying captain(s). While our data suggests that some of these patterns may yield distinct outcomes, we acknowledge features in a team's environment also contribute to the usefulness of a particular pattern of influence (e.g., the prevailing business need, the broader organizational culture) (Loignon et al., 2022).

Comparing How Your Expedition Stacks Up

To gain deeper insights, TeamVantage affords a relative comparisons approach with data to identify strengths and weaknesses compared to similar teams. Imagine you're back on Everest. You can gauge your progress not by focusing solely on the summit but by comparing your position to landmarks on the route or to how other climbers have made their ascent. These relative comparisons provide a clearer understanding of where you stand, even without precise altitude measurements. Similarly, rather than relying on absolute values (like

VISUALIZING THE VALUE OF NORMATIVE COMPARISONS



Note. Each dot in this plot corresponds to a different senior leadership team in our data. Dots are placed based on x-axis based on the team's average score and are then randomly "jittered" vertically to aid in visualization. Points along the x-axis where dots accumulate represent more typical scores for the teams in our sample. The colored dashed lines correspond to the 20th and 80th percentile for each group quality (i.e., relationship conflict on the left and psychological safety on the right). These data indicate that relying solely on the full range of possible values may lead one to incorrectly conclude that a score of 3 (i.e., each scales midpoint) is typical.

FIGURE 6

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a single survey result), a benchmarking approach focuses on relative or comparative analysis—such as understanding how one measurement stacks up against another, much like evaluating your position in relation to the mountain's key markers or to the time of day and approaching weather.

To help make such an approach clearer, consider Figure 6, which presents average team scores for two group qualities—relationship conflict and psychological safety. Each point corresponds to a single team, but instead of focusing on the exact numbers ("How did my team score?"), this comparative perspective helps a leader see how their team contrasts with others ("How much further ahead are we?").

While a relative perspective offers valuable insights, and may even be easier to grasp, limitations exist. First, the choice of comparison group matters significantly. Factors like the nature of the team's work or its industry may matter. Luckily, for teams using TeamVantage, and those attending CCL's Leadership at the Peak program, there is a fair amount of consistency—teams are drawn from the highest levels of the organization and feature executives and senior leaders. Secondly, such benchmarks represent a snapshot of a team's developmental journey. Thus, it is likely that significant changes to the team (e.g., team composition such as the loss of one or two members) might dramatically alter their dynamics. Therefore, benchmarks should be interpreted thoughtfully, considering the broader context and the point at which the team is at currently on their developmental journey, and supplemented with other data sources (e.g., additional metrics, team members' qualitative feedback, sensemaking with coaching expertise).

However, benchmarks are still excellent at providing more actionable feedback—making assessments worth the investment. Relative information helps us interpret unclear or ambiguous data. For instance, a team that completes projects in three days may feel efficient until they learn a similar team averages just one The same principle applies to team assessments aimed at development—knowing whether a team scores high or low is valuable, but understanding how those scores stack up against comparable teams adds important context and insight, which can help leaders prioritize areas of investment and improvement.

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Discussion

Reaching Your Team's Peak Effectiveness

Leading teams, especially those situated at the top of today's organizations, can be a challenging experience (Balakrishnan et al., 2020). Senior leadership teams are typically comprised of the organization's most talented individuals, who must rely on each other to advance the organization while simultaneously addressing their business areas' immediate needs and developing workflows and practices to maximize each person's contributions to the group. (Loignon et al., in press). With those dynamics at play, it is no surprise that teams at the top will often experience successes and challenges while moving from one crisis to the next (Luciano et al., 2020; Marks et al., 2001). Focusing on a leader's current team's effectiveness is invaluable for developing both the leader and the team, and CCL's TeamVantage assessment provides those necessary insights.

Our analysis of TeamVantage data from over 450 senior leadership teams identified multiple ways to maximize team effectiveness. We found that several group qualities consistently predict a team's leadership outcomes like team composition and member identification, how information is shared, how conflicts are managed, and the level of interpersonal risk members are willing to take. These factors reliably indicate whether a team exhibits high levels of direction, alignment, and commitment, which consistently relate to a team's results (Hackman, 1987). Therefore, team leaders and members should regularly assess how the team is performing in these three key areas (McCauley & Fick-Cooper, 2019; McCauley & Palus, 2021).

Consistently evaluating so many aspects of your team can seem complex and overwhelming—especially layered on top of one's daily work (Loignon et al., 2022). However, think of these group qualities as a trail system for plotting a team's journey based on your starting point or leadership strengths. There is no need to focus your energy on everything, everywhere, all at once. For example, a newly formed team with little experience may focus on establishing their direction (e.g., "What peak do we want to climb?"). Our findings (see Figure 2) suggest this new team should concentrate on ensuring team members strongly identify with the group. Without this, the team risks becoming a lower priority as members focus on other activities (Mistry et al., 2023). Conversely, for a team with members who have worked together before and know their complementary skill sets, there may be less focus on aligning efforts, but still a need to ensure sufficient commitment (Mohammed et al., 2010). Additional attention could be paid to actively managing personality clashes or differing values within the team (de Wit et al., 2012). Overall, our findings revealed a robust map of trails for a diverse range of teams to find their way to peak effectiveness.

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Pathways for Reaching the Mountaintop

So, where should you start? Along with general trends, we noticed that some key relationships among the constructs we examined were notably stronger than others. Consider these empirical pathways as well-blazed trails that are less precarious and more efficient.

Create A Safe Space

First, psychological safety emerged as a strong and consistent predictor of all three leadership outcomes. Psychological safety is the shared belief among a group of people about whether it's safe to take interpersonal risks at work (Edmondson, 1999). This environment allows them to engage in constructive conflict or confrontation and feel safe to experiment and take risks. Our finding shows that teams that cultivate psychological safety—through efforts that make employees feel their colleagues will accept them for who they are, respect their opinions, and trust each other's competence—will thrive. The data shows that psychologically safer teams typically report the most positive outcomes (Frazier et al., 2017; McCauley & Palus, 2021).

Communicate Clear Direction

Direction is essential for achieving key team outcomes, such as meeting performance objectives and maintaining strong relationships. Direction uniquely predicts how much team members feel they are thriving (Porath et al., 2012). Considering that leaders are responsible for interpreting events in the team's environment (McCauley & Fick-Cooper, 2019; Morgeson et al., 2010; Morgeson & DeRue, 2006; Zehnder et al., 2017), this makes their role crucial in charting the team's course, articulating the mission, and identifying goals. Our findings suggest that without direction, team members report less thriving/wellbeing (Porath et al., 2012), and this lack of direction may strain team members (Hackman & Oldham, 1976).

Encourage Robust Forms of Influence

In the social process of leadership, teams classified as "partners", where members see only one or two others as influential, report lower levels of direction, alignment, or commitment. This pattern may create "pockets" of influence or "subgroups" within the team (Carton & Cummings, 2012). If not managed well, these subgroups can lead to conflict (Lau & Murnighan, 1998; Meyer & Glenz, 2013; Shah et al., 2021) and reflect a "fracturing" of influence networks, limiting leadership outcomes (e.g., greater misalignment).

Cultivating robust forms of influence may require granting others the opportunity to take the lead within the team (DeRue & Ashford, 2010). This might involve how the leader engages with others in the team (e.g., asking questions) (Van Quaquebeke & Felps, 2018) and recognizing others' expertise based on their role within the team (Mathieu et al., 2015). Alternatively, other team members may need to more actively claim influence by explicitly stating their preference to lead a particular meeting or engaging more in the group's discussions (MacLaren et al., 2020; Marchiondo et al., 2015). These behavioral signals of one's intention to exert influence, or afford other's influence, are often integral in shaping this part of the social process.

Cultivate Commitment

Our findings suggest that a team's collective commitment strongly predicts how much members report learning. Because learning often occurs alongside daily activities, focusing on commitment can increase the effort needed to engage in organic, on-the-job skill-building (Chen et al., 2013). One way to increase commitment may be through leading by example (Eichenseer, 2023). By letting others see you take on difficult tasks and re-engaging in the team's initiatives in the face of setbacks, you may be more likely to see others do the same. So, if you're team is looking to climb to higher peaks, there can be value in leading throughout the process – whether it's during the initial work at basecamp all the way through to the summit.

Embarking on the journey to reach your team's peak performance involves navigating various pathways, each offering unique challenges and opportunities. By focusing on these pathways, leaders can create an environment where their teams can thrive, adapt, and achieve their highest potential—as long as leaders and their teams know where to start.

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The Value of a Strategic Planning Partner

Knowing precisely where you are on your journey and which trail you're traveling can be especially beneficial. However, this can be challenging when working with teams. A leader, on their own, may struggle with:

- Gathering candid thoughts and beliefs from team members about the team.
- Synthesizing this information into a meaningful summary.
- Interpreting key nuances, such as the insights shared above.

A carefully constructed assessment, like TeamVantage, helps systematically and confidentially capture this information. It provides feedback to the team's leader and enables them to make informed decisions in conjunction with their coach. Importantly, TeamVantage offers team-based relative comparisons. This is crucial because the "actual" or "real" scale, along with the data provided (1-5), is rarely used by team members. For example, consider relationship conflict: imagine what it would take for most team members to rate an item like "Personality clashes are evident in this team" as a 5. A 5 likely represents a very salient, disruptive, and charged clash, which is rare or uncommon. However, even a "tamer" version of a personality clash rated as a 3/5 indicates exceptional levels of relationship conflict in our sample. According to our analyses, these teams would be expected to struggle with direction, alignment, and commitment, as well as their team's effectiveness (e.g., performance, satisfaction).

Understanding your team's current position and the path you're on is crucial for strategizing your ascent to peak performance. However, this is not always straightforward. Leaders often face challenges in gathering honest feedback, synthesizing insights, and recognizing subtle dynamics within their teams. This may be especially true if one's team is not co-located or the leader is regularly traveling (Antonakis & Atwater, 2017). This is where tools like TeamVantage become invaluable. They provide a structured and anonymous way to capture team dynamics, offering leaders the insights needed to make informed decisions with their coaches.

The Summit Awaits

Climbing to peak team effectiveness is much like ascending a challenging mountain. It requires careful preparation, strategic planning, and the right tools to navigate the terrain. Just as climbers rely on guides, maps, and equipment to reach the summit, leaders need insights, assessments, and frameworks to guide their teams to success. As you embark on this journey, remember that reaching the summit is a gradual and collaborative process, achieved in stages. With rigorous assessments, like TeamVantage as your guide, you can confidently lead your team to peak effectiveness, ensuring that every step taken is purposeful and aligned with your ultimate goals.

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Amy Soto has 25 years of experience as a leadership development and organizational development practitioner. For the last 5 years, she was the product manager of the Leadership at the Peak (LAP) program, in which TeamVantage is part of the assessment package.

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Appendix A. Psychometric Properties of TeamVantage

For TeamVantage to serve as a useful guide for leaders and their teams on their developmental journey, it needs to provide consistent and valid information. Thus, it is important to document that TeamVantage exhibits sufficient evidence of its psychometric properties. This appendix reviews such evidence.

Participants and Procedure

This data consists of ratings from 489 senior leaders who participated in a 5-day leadership development program designed for C-level executives. The program offers insights into their leadership effectiveness, strategies to enhance influence with stakeholders like boards and shareholders, and methods to improve wellbeing. Participants attended the program between August 2019 and July 2023. The leaders in this study come from a wide range of industries and leadership backgrounds, representing 32 different sectors such as government (n = 52), manufacturing (n = 38), and aerospace and defense (n = 37). They led organizations varying in size from fewer than 100 employees to over 10,000. On average, the senior leadership teams consisted of about 7 members (M = 7.36, SD = 2.49). The team leaders were typically 51 years old (SD = 6.85) and hailed from 32 different countries. Most had been with their current organization for 13 years (SD = 10.90), identified as male (73%), held graduate degrees (68%), and self-identified as white (82%). During the program, leaders and their teams completed CCL's TeamVantage assessment.

Psychometric Analyses

We conducted several analyses to evaluate the underlying psychometric properties of TeamVantage. These results provide evidence supporting the validity of the sub-scales on the assessment, the reliability of these sub-scales, and the aggregation properties of these measures (Woehr et al., 2015; Chan, 1998; Landy, 1986).

Factor Structure of TeamVantage

To determine whether the theorized or anticipated structure of TeamVantage corresponded with senior leaders' and their team members' ratings, we estimated a confirmatory factor analysis featuring each of the subscales. In this model, each of the items from the subscales loaded on its intended factor. The model exhibited adequate fit (χ^2 (1234) = 11331.55, p < .001; CFI = .94, TLI = .93, RMSEA = .04, SRMR = .04), which suggests that the intended structure of the assessment corresponded to team member's ratings (Hu & Bentler, 1999). Factor loadings were also supportive of this model (Table A1, following page). The average standardized factor loading was .78 (.23 to .92). Furthermore, considering each sub-scale separately, the average ranges from .68 (for psychological safety) to .86 (for commitment). These values largely exceed common thresholds of .40 for the loadings of particular items (Tabachnick & Fidell, 2014). One exception to this trend, where the average is slightly lower, is for the identity-defend subscale (.37).

Internal Consistency of Subscales

We also considered the internal consistency of the sub-scales within TeamVantage and estimated the coefficient alpha for each measure (Table A2, following page). Coefficient alpha, as a measure of internal consistency, represents the average inter-correlation among the items from the same scale. Typically, values greater than .70 represent internal consistency, although, like all rules of thumb, this should be considered carefully (Lance et al., 2006). All sub-scales, except for team identity-defend (α = .33), exceed this threshold. This suggests an adequate level of internal consistency for the majority of measures included within TeamVantage.

Convergent and Divergent Validity of Subscales

We also considered the relationships among the subscales within TeamVantage (i.e., patterns of convergent and discriminant validity). Table A3, page 21, reports the factor-level correlations among the sub-scales of TeamVantage. These correlations, therefore, correct for measurement error and represent a more rigorous assessment of the degree of convergent and discriminant validity (Shaffer et al., 2016). Regarding discriminant validity, the primary concern is whether team members and their leaders are able to distinguish or delineate between the sub-scales included in TeamVantage. We found that the highest correlation among subscales was for direction and alignment

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STANDARDIZED FACTOR LOADINGS ACROSS SUB-SCALES OF TEAMVANTAGE

Sub-Scale	Item	Standardized Factor Loading
Direction	1	0.86
Direction	2	0.86
Direction	3	0.80
Alignment	4	0.86
Alignment	5	0.85
Alignment	6	0.80
Commitment	7	0.86
Commitment	8	0.86
Commitment	9	0.88
Information Sharing	10	0.76
Information Sharing	11	0.82
Information Sharing	12	0.78
Information Sharing	13	0.74
Task Conflict	14	0.79
Task Conflict	15	0.85
Task Conflict	16	0.81
Relationship Conflict	17	0.87
Relationship Conflict	18	0.92
Relationship Conflict	19	0.74
Psychological Safety	20	0.67
Psychological Safety	21	0.71
Psychological Safety	22	0.70
Psychological Safety	23	0.70
Psychological Safety	24R	0.64
Psychological Safety	25R	0.64
Psychological Safety	26R	0.68
Identity-Defend	27	0.23
Identity-Defend	28	0.54
Identity-Defend	29	0.33
Identity-Collective	30	0.68
Identity-Collective	31	0.79
Identity-Collective	32	0.73
Satisfaction	33	0.82
Satisfaction	34	0.87
Satisfaction	35	0.86
Learning	36	0.86
Learning	37	0.90
Learning	38	0.82
Learning	39	0.65
Thriving	40	0.86
Thriving	41	0.91
Thriving	42	0.84
Thriving	43	0.83
Team Performance	44	0.85
Team Performance	45	0.80
Team Performance	46	0.84
Team Performance	47	0.85
Team Performance	48	0.87

Note. Sub-scales refer to the specific measures included within TeamVantage. Standardized factor loadings represent the degree to which a given item is associated with (i.e., "loads onto") its intended construct.

TABLE A1

INTERNAL CONSISTENCY (COEFFICIENT ALPHA) ESTIMATES FOR SUB-SCALES

Sub-Scale	Cronbach's Alpha
Direction	0.87
Alignment	0.87
Commitment	0.90
Information Sharing	0.85
Task Conflict	0.86
Relationship Conflict	0.88
Psychological Safety	0.85
Identity-Defend	0.33
Identity-Collective	0.77
Team Satisfaction	0.90
Learning	0.88
Thriving	0.92
Team Performance	0.92

Note. Cronbach's Alpha is a measure of internal consistency and reflects the average correlation among items for a given sub-scale.

TABLE A2

(.86). These elevated correlations make sense given that these two subscales correspond to two core components of the broader DAC model (Drath et al., 2008; McCauley & Fick-Cooper, 2019). Importantly, though, these values are near or fall below prevailing cutoffs for ensuring discriminant validity (Rönkkö & Cho, 2022; Shaffer et al., 2016).

We also considered evidence of convergent validity or whether subscales measuring similar constructs correlate with one another. There are several key pieces of supportive evidence. First, task conflict and relationship conflict are positively correlated (.66). This is consistent with the broader literature that views both forms of conflict as similar, yet distinct (de Wit et al., 2012). That is, if a team is experiencing conflicts regarding their ideas and strategies, they are also likely to experience personality clashes. Second, we observed positive correlations between team performance and team satisfaction (.83). This is consistent with the prevailing perspective in the literature that both performance and satisfaction are related, yet distinct, aspects of a team's overall effectiveness (Hackman, 1987). Put simply, it is possible to have teams who are meeting their objectives and see that their members are not fully satisfied with their experiences in the team.

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FACTOR-LEVEL CORRELATIONS AMONG SUB-SCALES FOR TEAMVANTAGE

	1	2	3	4	5	6	7	8	9	10	11	12
1. Direction												
2. Alignment	.86											
3. Commitment	.62	.73										
4. Information Sharing	.57	.68	.65									
5. Tasks Conflict	-.51	-.58	-.49	-.43								
6. Relationship Conflict	-.46	-.53	-.53	-.46	.66							
7. Psychological Safety	.63	.70	.73	.74	-.59	-.68						
8. Identity-Defend	.16	.12	.18	.24	-.04	.02	.20					
9. Identity-Collective	.45	.46	.47	.50	-.26	-.25	.54	.67				
10. Satisfaction	.67	.76	.74	.71	-.55	-.63	.83	.23	.55			
11. Learning	.42	.41	.43	.48	-.24	-.24	.47	.30	.43	.51		
12. Thriving	.50	.48	.45	.43	-.27	-.30	.52	.28	.48	.56	.56	
13. Team Performance	.69	.76	.71	.68	-.53	-.53	.72	.20	.49	.83	.49	.51

Note. Correlations correspond to associations among factor scores, which are corrected for measurement error.

TABLE A3

Aggregation Indices for TeamVantage's Sub-Scales

We also examined the degree to which members of the same team provided similar or consistent ratings for each subscale. This is an important consideration both conceptually and methodologically. Conceptually, many of the subs-scales on TeamVantage capture constructs that are theorized to exist as shared experiences among team members. Psychological safety, for example, is generally thought to represent a climate in which team members have a shared understanding of the interpersonal risks associated with raising ideas, challenging assumptions, or offering feedback (Edmondson, 1999). Methodologically, exceptionally low levels of within-team consistency or agreement would suggest that teams, as measured by TeamVantage, may fail to conform to these definitions and, thus, may not meet the assumptions of typical team-level studies (LeBreton & Senter, 2008; Woehr et al., 2015).

There are two key statistics used to assess the similarity and consistency of team members' ratings (Table A4). First, the rwg index, which is considered a measure of inter-rater agreement, represents the extent to which team members provide the same rating and whether this level of agreement exceeds what would be expected based on some theoretical null distribution (James et al., 1993). Rules-of-thumb suggest that this value should reach minimum value of .70 but preferably exceed .80 when examining a sample of teams (Woehr et al., 2015). Given these cutoffs, we find support for adequate inter-rater agreement based on the rwg across the sub-scales of TeamVantage. This suggests that, when thinking of their experiences within the team, members of the same team tend to report similar values across the sub-scales. Importantly, though, there is also meaningful variability around these mean rwg values (SDrwg = .11 to .22). This suggests that, within some teams, team members can disagree about these constructs. Such disagreements have been discussed theoretically within the teams literature (Cole et al., 2011) and have been found to be relevant for team-level effectiveness with senior leadership teams when completing TeamVantage (Loignon et al., 2022).

We also calculated intraclass correlation coefficients (ICCs) for the sample of teams (Bliese, 2000). ICCs come in two forms, ICC(1) and ICC(2), which measure the proportion of within- vs. between-team variance, respectively. These indices test whether there is both sufficient within-team consistency and between-team differentiation. Rules-of-thumb for interpreting these indices suggest that .20 and .60 are necessary (Woehr et al., 2015). Again, we find that most subscales within TeamVantage surpass these cutoffs. There are, though, four exceptions: identity – collective, identity – defend,

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AGGREGATION INDICES FOR TEAMVANTAGE SUB-SCALES

	r_{wg}			
Sub-Scales	Mean	SD	ICC(1)	ICC(2)
Direction	.75	.18	0.22	0.67
Alignment	.74	.18	0.23	0.68
Commitment	.79	.16	0.18	0.62
Identity-Collective	.82	.13	0.06	0.31
Identity-Defend	.79	.13	0.03	0.20
Information Sharing	.85	.11	0.16	0.58
Task Conflict	.77	.15	0.19	0.63
Psychological Safety	.84	.12	0.19	0.63
Relationship Conflict	.76	.23	0.27	0.72
Team Performance	.85	.13	0.26	0.72
Team Satisfaction	.80	.16	0.21	0.65
Learning	.83	.14	0.09	0.42
Thriving	.78	.17	0.08	0.38

Note. Aggregation indices reflect the extent to which members from the same team agree on or are consistent in their ratings ofeach construct. rwg was estimated while assuming a uniform null distribution for team members' disagreement (Woehr et al., 2015).

TABLE A4

thriving, and learning. These constructs represent, then, areas where teams may not differ substantially either due to inconsistencies within a team (e.g., team members having distinct experiences) or limited differences between teams (e.g., similar levels of a construct across the entire sample) (Woehr et al., 2015).

Structural Equation Model for Team Qualities, DAC, and Team "Results"

Having provided initial psychometric evidence for TeamVantage, we then proceeded to use these data to inform key insights about leadership and team effectiveness. The analyses in this section pertain to the results related to the relationships among team qualities, outcomes of leadership (DAC) and the team's "results." Within our paper, Figure 1 provides a visual overview of this framework and Figures 2 and 3 provide specific findings. Because we observed support for the aggregation of the subs-scales on TeamVantage, we used the team's average scores for each construct in these analyses.

More specifically, we estimated a structural equation model that featured latent factors, defined by their respective items pertaining to team qualities (i.e., information sharing, task conflict, relationship conflict, identity, and psychological safety), outcomes of leadership (i.e., direction, alignment, and commitment), and team effectiveness of "results" (i.e., team performance, team satisfaction, learning, and thriving).

This model, like the earlier measurement model, exhibited adequate fit (χ^2 (1010) = 2942,31, $p < .001$; CFI = .93, TLI = .93, RMSEA = .06, SRMR = .05). Within this model, factor loadings were, on average, quite large and all were positive (M = .84, SD = .14, min. = .28, max = .96). Thus, this model, which introduces key pathways among the constructs assessed by TeamVantage, affords a reasonable representation of the data and thus can be used to consider important relationships.

We then used the correlations among the latent variables from this structural equation model to conduct a dominance analysis (Braun et al., 2019). Dominance analysis allowed us to determine the relative importance of different predictor variables (i.e., factors) in explaining the outcomes of leadership (i.e., DAC) as well as the "results" or measures of a team's effectiveness. Specifically, this analysis compares how much each factor contributes to explaining the outcome, both on its own and in combination with other factors. The predictor that explains the most variability across all possible combinations of a predictor is thought to be most dominant. We summarized our findings in Figures 2 and 3 of the manuscript, while Table A5 below provides specific point estimates.

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DOMINANCE ANALYSIS FOR PREDICTING DIRECTION, ALIGNMENT, AND COMMITMENT (LEFT-HAND) AND MEASURES OF TEAM EFFECTIVENESS (RIGHT-HAND)

Predictor	Outcome	R^2	Percentage	Rank
Information Sharing	Direction	0.12	19.35	4
Task Conflict	Direction	0.14	23.77	1
Relationship Conflict	Direction	0.06	10.27	5
Psychological Safety	Direction	0.13	22.32	2
Identity - Defend	Direction	0.02	3.61	6
Identity - Collective	Direction	0.12	20.68	3
Total	**Direction**	**0.60**	**100.00**	
Information Sharing	Alignment	0.18	23.87	3
Task Conflict	Alignment	0.18	24.20	2
Relationship Conflict	Alignment	0.10	13.00	4
Psychological Safety	Alignment	0.18	24.21	1
Identity - Defend	Alignment	0.02	2.59	6
Identity - Collective	Alignment	0.09	12.14	5
Total	**Alignment**	**0.76**	**100.00**	
Information Sharing	Commitment	0.20	25.93	2
Task Conflict	Commitment	0.09	12.53	5
Relationship Conflict	Commitment	0.11	14.60	3
Psychological Safety	Commitment	0.23	30.66	1
Identity - Defend	Commitment	0.01	1.81	6
Identity - Collective	Commitment	0.11	14.47	4
Total	**Commitment**	**0.76**	**100.00**	**NA**

Construct	Outcome	R^2	Percentage	Rank
Team Satisfaction	Direction	0.19	23.39	3
Team Satisfaction	Alignment	0.30	36.79	2
Team Satisfaction	Commitment	0.32	39.83	1
Team Satisfaction	**Total**	**0.81**	**100.00**	
Learning	Direction	0.12	32.02	2
Learning	Alignment	0.09	24.84	3
Learning	Commitment	0.16	43.14	1
Learning	**Total**	**0.38**	**100.00**	
Thriving	Direction	0.17	40.45	1
Thriving	Alignment	0.12	28.68	3
Thriving	Commitment	0.13	30.87	2
Thriving	**Total**	**0.41**	**100.00**	
Division Performance	Direction	0.16	26.55	3
Division Performance	Alignment	0.22	37.47	1
Division Performance	Commitment	0.22	35.99	2
Division Performance	**Total**	**0.60**	**100.00**	

Note. Correlations correspond to associations among factor scores, which are corrected for measurement error.

TABLE A5

Examining Patterns of Influence Within Teams Using Social Network Analysis

When completing TeamVantage, senior leaders and their team members provided round-robin ratings of influence. Each person indicated who else on the team leads them (1 = this person influences me, 0 = this person does not influence me). Given their round-robin structure (i.e., each person rates everyone else in the group), we could analyze these data using social network analyses (Wasserman & Faust, 1994). We calculated three indices:

- Density refers to the proportion of connections that are observed in the team's network relative to the total number of connections that are possible.
- Centralization refers to the degree to which social interaction in a network is focused around one or a few central individuals.
- Reciprocity refers to the extent to which two team members provide the same ratings of their relationship.

Each team in our sample, then, had three measures that characterized their influence networks. We then conducted a cluster analysis that used these three indices as input. After reviewing several indices for selecting the number of clusters (e.g., silhouette width) (Aldenderfer & Blashfield, 1984), we decided that three

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clusters was a reasonable solution. Specifically, this solution provided a reasonable classification of all 489 senior leadership teams while being parsimonious and not over-extracting too many clusters. Table A6 reports the number of teams assigned to each cluster and summarizes the differences in the three network measures across the clusters.

DIFFERENCES IN NETWORK MEASURES ACROSS CLUSTERS OF INFLUENCE NETWORKS

Cluster	Network Measure	*n*	M	SD	Min	Max
Partners	Interconnectedness	119	0.23	0.06	0.05	0.36
	Convergence		0.43	0.12	0.11	0.63
	Mutual Connections		0.21	0.19	0.00	0.67
Collaborators	Interconnectedness	182	0.42	0.09	0.28	0.67
	Convergence		0.56	0.12	0.12	0.75
	Mutual Connections		0.38	0.22	0.00	0.89
Captains	Interconnectedness	188	0.26	0.06	0.12	0.34
	Convergence		0.77	0.09	0.62	1.00
	Mutual Connections		0.16	0.20	0.00	1.00

Note. Each cluster was identified using the three network measures (i.e., interconnectedness, convergence, and mutual connections). Descriptive statistics for each measure are reported in the right-hand columns.

TABLE A6

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Appendix B.
Recent Revisions to TeamVantage

TeamVantage is able to provide a wealth of information to the leaders and team members who complete the assessment and has yielded an array of powerful insights (see Appendix A). Since its initial development, several opportunities for further enhancing the assessment have emerged. These include clarifying specific content within some items and enhancing the assessment's visualizations as well as reducing its length. Thus, as part of a recent revision, we sought to revise the assessment to enhance its utility while preserving its underlying properties. This appendix describes these efforts.

Revisions Made to TeamVantage

During the revision process, a working group of stakeholders reviewed TeamVantage and identified several areas for further improvement. Several of these changes, and corresponding rationale, are provided below.

Items Removed

A key consideration with any assessment is its feasibility. This is especially true for TeamVantage, which is administered to senior leaders and their teams who often must juggle competing demands for their time (e.g., Cycota & Harrison, 2006). Thus, based on the data available, past experiences of clients, faculty, and coaches, we identified several subscales within TeamVantage that, although informative, could be removed while still affording a meaningful assessment for senior leaders and their teams. Specifically, subscales pertaining to faultlines within the team, peer evaluations, and more nuanced forms of networks were removed. This change was intended to shorten the assessment while maintaining its alignment with the objectives of its intended use.

New Items

By removing items, we also created opportunities to introduce new content that allows TeamVantage to better meet its objectives within CCL's client engagements. Specifically, we added or revised three new sets of items. First, we created a new section focusing on how teams leverage the talent available to them. A team's ability to maximize the value of its members' backgrounds, knowledge, skills, and abilities is critical and revolves around many of the practices that are assessed within TeamVantage (e.g., Loignon et al., 2022, in press). We followed a multi-step item development process in which we defined the broader conceptual domain, reviewed the literature to identify existing frameworks or similar measures, drafted an item pool, and then reviewed and culled the item pool in conjunction with several subject matter experts (Hinkin, 1995). These items were then pilot tested as part of a subsequent data collection effort, which is described below in this appendix.

Second, we also incorporate a new item that focuses explicitly on team member's wellbeing. This item was included in response to the importance of wellbeing as a criterion in its own right (Tay et al., 2023) and the role that wellbeing plays in relationship to leadership and a leader's development (Inceoglu et al., 2018; Skakon et al., 2010). Thus, along with understanding whether they and their team members are thriving (Porath et al., 2012), leaders will now receive data on the nature of wellbeing within their group.

Third, we also incorporated an item that directly assesses the ability of a team to form key connections with other stakeholders in its environment. Such boundary spanning activities are critical not only for individuals or the team's leader, but also for teams themselves (Ernst & Chrobot-Mason, 2010; Loignon et al., 2022).

Finally, we also revised the open-ended comments section of TeamVantage to capture the strengths, challenges, and opportunities for improvement that are facing the team as a whole. These revised questions are intended to complement those that capture the key challenges that a leader is facing personally (Balakrishnan et al., 2020; Tonidandel et al., 2022). That is, leaders can consider how their challenges are related to and distinct from those facing their team and reflect upon which actions are best suited for collective efforts and what is most relevant for their personal development.

Normative Data

As we noted in our paper, there can be value in

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understanding how one's team compares to others drawn from a similar context or population. Thus, the revised TeamVantage now features normative data. Normative comparisons are based on a sample of over 450 senior leadership teams whose leaders attended CCL's Leadership at the Peak program between 2020 and 2023 (see "Participants and Procedure" under Appendix A). These leaders and their teams represent a range of industries, levels of tenure, and composition of professional backgrounds.

Table B1 summarizes the normative comparisons, which reflect the 20th and 80th percentiles from the comparison sample, for each of the subscales in TeamVantage. For newly developed scales, we report normative values from existing subscales that exhibited the highest correlation during the pilot test ($r >= .49$).

NORMATIVE COMPARISONS FOR SUBSCALES IN TEAMVANTAGE

Subscale	20th Percentile	80th Percentile
Identity - Collective	4.07	4.50
Identity - Defend	3.44	3.92
Information	3.81	4.32
Psychological Safety	3.80	4.41
Relationship Conflict	1.23	2.09
Team Satisfaction	3.72	4.47
Task Conflict	1.78	2.51
Team Performance	3.85	4.50
Learning	3.95	4.44
Thriving	3.84	4.35
Connection*	3.79	4.45
Team Talent*	3.80	4.41
Well-Being*	1.65	2.16
Direction	3.33	4.10
Alignment	3.21	4.07
Commitment	3.79	4.45
Influence – Interconnectedness	0.22	0.40
Influence – Convergence	0.45	0.76
Influence – Mutual Connections	0.00	0.46
Support – Interconnectedness	0.58	0.86
Support – Convergence	0.12	0.31
Support– Mutual Connections	0.62	0.89

Note. * identifies subscales that are newly developed and do not have archival data available. Thus, the norms presented here are based on similar subscales (per the pilot test described below) and will be updated once the revised version of TeamVantage has been completed by a large enough sample of leaders and their teams.

TABLE B1

Scale Reduction Process

There is a growing recognition within the broader field of leadership that longer measures, especially when the content is not usefully redundant, can actually limit the utility of a scale. Furthermore, shorter scales are often more pragmatic because they require less time for respondents (Matthews et al., 2022). Thus, while revising TeamVantage, we used archival data (see earlier Participants and Procedure in Appendix A) to empirically identify a subset of items that maintained the psychometric strengths of the full assessment while dramatically reducing its length.

We did this in several steps (Matthews et al., 2022). First, we estimated a separate confirmatory factor analysis for each subscale on TeamVantage. These models were intended to identify the highest loading item(s). Table

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B2 provides a summary of these models. Importantly, all fit indices were supportive of these "trimmed" models and the standardized factor loadings were high and exceeded common cutoffs. One important note is that these analyses suggested that the subscale for psychological safety required at least three items. If we were to limit the trimmed scale to fewer than three items, the fit of these models significantly decreased

Second, we then considered the associations with the shortened subscales (1-3 items) with key criterion measures (see Table B3). Specifically, we used each subscale to predict two outcome measures: satisfaction and performance. This test, then, considers the degree to which the shortened and full subscale correlate with both criteria, the degree to which these associations differ between the shortened and full versions of a subscale, and the proportion of the relationship for the shortened measure relative to the full. These findings suggest that shortened scales afford levels of criterion-validity that are quite similar to those of the full scales.

Third, we considered whether the patterns of inter-rater agreement (Table B4) and inter-rater consistency (Table B5) varied between the trimmed and full subscales. For both comparisons, we find that the degree to which team members provide similar and consistent ratings does not differ if we use the shortened or full subscales.

Fifth, we also considered the degree to which scores from the shortened subscale correlate with the full measure. Table B6 reports these correlations, which are, on average positive and significant (r = .90, min. = .68, max. = .95). This suggests that the scores from the shortened subscales are highly consistent with those from the longer measure.

Taken as a whole, it appears that the shortened scales, across several different analyses and tests, function quite consistently when compared to the full-length scales. Given that these shortened measures would dramatically reduce the response time for respondents, which ultimately would make the assessments more practical and user-friendly (Matthews et al., 2022), we proceeded with these trimmed versions in the revised version of TeamVantage

CONFIRMATORY FACTOR ANALYSIS FOR SHORTENED SUBSCALES

Sub-Scales	X^2	d*f*	CFI	RMSEA	SD Factor Loading	Communality
Information Sharing	168.08	2.00	0.96	0.20	0.87	0.76
Psychological Safety	405.41	14.00	0.92	0.12	0.71	0.51
Relationship Conflict	0.00	0.00	1.00	0.00	0.90	0.80
Task Conflict	0.00	0.00	1.00	0.00	0.86	0.74
Thriving	30.96	2.00	1.00	0.09	0.92	0.84
Learning	262.10	2.00	0.94	0.26	0.91	0.84
Team Performance	104.30	5.00	0.99	0.10	0.86	0.73
Team Satisfaction	0.00	0.00	1.00	0.00	0.90	0.81
Identity-Collective	0.00	0.00	1.00	0.00	0.84	0.70
Identity-Defend	0.00	0.00	1.00	0.00	0.67	0.45

Note. Each confirmatory factor analysis was estimated separately for each scale.

TABLE B2

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CRITERION-RELATED VALIDITY BETWEEN SHORTENED- AND FULL-SCALES

Sub-Scales	Team Performance						Team Satisfaction					
	Shortened Scale	Full Scale	Difference	95% Lo	95% Hi	Prop.	Shortened Scale	Full Scale	Difference	95% Lo	95% Hi	Prop.
Info Sharing	0.70	0.85	-0.08	-0.09	-0.07	0.91	0.75	0.82	-0.07	-0.08	-0.06	0.91
Psych Safety	0.80	0.85	-0.05	-0.06	-0.04	0.94	0.82	0.87	-0.05	-0.05	-0.04	0.95
Relationship Conflict	-0.61	-0.68	0.07	0.05	0.08	0.90	-0.66	-0.72	0.06	0.04	0.07	0.92
Task Conflict	-0.65	-0.74	0.09	0.08	0.11	0.88	-0.64	-0.72	0.08	0.07	0.10	0.89
Thriving	0.69	0.74	-0.06	-0.07	-0.05	0.93	0.69	0.75	-0.05	-0.06	-0.05	0.93
Learning	0.72	0.79	-0.06	-0.07	-0.05	0.92	0.70	0.76	-0.05	-0.06	-0.05	0.93
Team Performance	-0.67	-0.73	0.06	0.05	0.07	0.91	-0.63	-0.69	0.06	0.05	0.07	0.92
Team Satisfaction	-0.68	-0.71	0.04	0.03	0.05	0.95	-0.69	-0.72	0.03	0.02	0.04	0.95
Identity-Collective	0.68	0.75	-0.07	-0.08	-0.06	0.91	0.69	0.75	-0.06	-0.07	-0.05	0.92
Identity-Defend	0.25	0.53	-0.28	-0.32	-0.24	0.48	0.22	0.48	-0.26	-0.29	-0.22	0.47

Note. Values correspond to the correlation between the subscales of TeamVantage and two measures of effectiveness (i.e., team performance and team satisfaction). These are estimated for the shortened scales as well as the full-length scales. The difference between these correlations are reported as well as the 95% confidence interval for these differences and the relative or proportional magnitude of the two sets of criterion-related validity coefficients.

TABLE B3

INTER-RATER AGREEMENT FOR SHORTENED AND FULL-SUBSCALES

Sub-Scales	Shortened			Full			Difference for Shortened vs. Full			
	Mean	Median	SD	Mean	Median	SD	Mean	SD	Min.	Max.
Identity-Collective	0.76	0.85	0.21	0.82	0.86	0.14	-0.07	0.13	-0.74	0.33
Identity-Defend	0.55	0.60	0.29	0.79	0.82	0.13	-0.24	0.25	-0.85	0.33
Task Conflict	0.69	0.71	0.17	0.77	0.79	0.13	-0.08	0.10	-0.57	0.15
Information Sharing	0.78	0.85	0.16	0.85	0.88	0.11	-0.07	0.11	-0.60	0.39
Psych Safety	0.80	0.84	0.15	0.85	0.88	0.12	-0.04	0.08	-0.45	0.22
Relationship Conflict	0.69	0.72	0.25	0.77	0.83	0.21	-0.08	0.12	-0.70	0.31
Team Performance	0.82	0.87	0.14	0.86	0.89	0.89	-0.04	0.08	-0.42	0.16
Team Satisfaction	0.73	0.79	0.20	0.80	0.82	0.14	-0.06	0.11	-0.71	0.22
Thriving	0.73	0.80	0.21	0.78	0.83	0.16	-0.05	0.10	-0.52	0.16
Learning	0.78	0.85	0.18	0.84	0.88	0.13	-0.06	0.10	-0.58	0.25

Note. Distributions of inter-rater agreement indices (rwg) are reported for the shortened and full-length measures. We also report the difference between the shortened and full-length measures in terms of rwg. rwg was estimated while assuming a rectangular null distribution for disagreement within teams (Woehr et al., 2015)

TABLE B4

INTER-RATER RELIABILITY OR CONSISTENCY FOR SHORTENED AND FULL-SUBSCALES

Sub-Scales	Shortened		Full-Length		Difference	
	ICC(1)	ICC(2)	ICC(1)	ICC(2)	ICC(1)	ICC(2)
Identity-Collective	0.03	0.16	0.07	0.33	-0.04	-0.18
Identity-Defend	0.02	0.10	0.03	0.17	-0.01	-0.07
Information Sharing	0.13	0.52	0.15	0.56	-0.02	-0.04
Task Conflict	0.16	0.58	0.19	0.62	-0.02	-0.04
Psychological Safety	0.17	0.59	0.18	0.61	-0.01	-0.02
Relationship Conflict	0.23	0.68	0.26	0.72	-0.04	-0.04
Thriving	0.06	0.31	0.08	0.39	-0.02	-0.07
Learning	0.05	0.28	0.08	0.38	-0.03	-0.10
Team Performance	0.17	0.59	0.24	0.70	-0.07	-0.10
Team Satisfaction	0.16	0.57	0.18	0.61	-0.02	-0.04

Note. ICC estimates were calculated using the shortened and full-length scales. Differences pertain to ICC estimates for either type of measure.

TABLE B5

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CONVERGENT VALIDITY BETWEEN SHORTENED AND FULL-SUBSCALES

Sub-Scales	Convergent Validity at Team Level
Psychological Safety	0.95
Relationship Conflict	0.95
Task Conflict	0.93
Thriving	0.94
Learning	0.92
Team Performance	0.92
Team Satisfaction	0.95
Identity-Collective	0.86
Identity-Defend	0.69

Note. Convergent validity reflects correlations among shortened- and full-length subscales within TeamVantage using teams' average scores.

TABLE B6

Pilot Test of Revised TeamVantage

Given the changes that were made to TeamVantage, we conducted an initial pilot test of the revised, shortened assessment. Specifically, we used Prolific Academic and sought to recruit 275 leaders who closely resembled the senior leaders within many of CCL's programs. Specifically, we applied several filters (e.g., full-time position, leadership/managerial duties, 5+ years of management experience, working in a team, decision-making responsibilities) that reduced the potential population of respondents to one that corresponded to leaders of teams in a firm. Ultimately, we obtained usable responses from 253 respondents.[3] Importantly, these data only reflect the team leader's perspective and, thus, are unable to capture the entire team's experience like with a traditional administration of TeamVantage.

Nevertheless, the findings from this initial pilot test are illuminative (see Table B7). In particular, we see that the typical values (mean, standard deviation) for each of the subscales is consistent with what is often observed with earlier versions of TeamVantage (see Table B1 for normative values). We also see patterns of correlations that replicate previously observed relationships among key subscales. For example, the outcomes of leadership (direction, alignment and commitment) are positively associated while both forms of conflict (e.g., task and relationship) are negatively associated with many of the other subscales. Interestingly, two of the latest additions to TeamVantage (i.e., measures of maximizing team talent and connections) show promise for further understanding of key effects within teams. For example, leveraging team talent is more strongly and negatively associated relationship conflict (r = -.50) than with task conflict (r = -.13). This suggests, as others have noted (de Wit et al., 2012), that task conflict, if managed well, may not inhibit team performance whereas relationship conflict appears to be something that could limit the team's ability to maximize the value of its talent. If stronger, external connections are formed by the team, and it also seems that the group is better able to utilize its talent (r = .46). This suggests, albeit somewhat tentatively, that ensuring that one's team is boundary spanning effectively may reap additional benefits by allowing team members to fully leverage their skills and abilities.

Admittedly, this initial pilot test features several key limitations. First, we are drawing upon a population that diverges from that in which TeamVantage has been traditionally used (i.e., team leaders sampled from a broader population rather than senior leaders within CCL's programs). Likewise, these data only capture team leaders' perspective while TeamVantage typically includes both the leaders and their team member's ratings. Thus, there may be important boundary conditions between these findings and what, ultimately, unfolds as the revised TeamVantage is deployed. Nevertheless, these findings are encouraging as they suggest that the shortened and revised version of TeamVantage yields findings that are largely consistent with those afforded by earlier versions.

[3] Respondents were excluded from the study for exceptionally fast response times and for failing to accurately complete attention check items (Meade & Craig, 2012).

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FACTOR-LEVEL CORRELATIONS AMONG SUB-SCALES FOR TEAMVANTAGE

Sub-Scales	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Direction	4.38	0.50	*.83*													
Alignment	4.28	0.55	0.64	*.82*												
Commitment	4.29	0.54	0.68	0.78	*.83*											
Information Sharing	4.41	0.62	0.43	0.43	0.43											
Task Conflict	2.28	0.93	-0.22	-0.26	-0.33	-0.10										
Relationship Conflict	2.00	0.95	-0.38	-0.44	-0.56	-0.28	0.38									
Psych Safety	3.79	0.67	0.34	0.45	0.46	0.26	-0.07	-0.35								
Identity-Defend	3.85	1.11	0.16	0.04	0.09	0.00	-0.02	-0.01	0.05							
Identity-Collective	4.45	0.69	0.35	0.39	0.44	0.29	-0.07	-0.26	0.31	0.09						
Team Satisfaction	4.37	0.63	0.38	0.58	0.63	0.47	-0.21	-0.44	0.36	0.03	0.36					
Learning	4.38	0.66	0.38	0.39	0.41	0.39	-0.01	-0.25	0.32	0.06	0.43	0.46				
Thriving	4.23	0.71	0.46	0.51	0.54	0.34	-0.13	-0.32	0.33	0.11	0.25	0.46	0.39			
Team Performance	4.53	0.56	0.42	0.52	0.57	0.51	-0.15	-0.33	0.20	0.08	0.34	0.50	0.39	0.47		
Team Talent	4.25	0.58	0.63	0.65	0.70	0.49	-0.13	-0.50	0.48	0.09	0.43	0.55	0.51	0.61	0.56	*.80*
Connection	4.21	0.78	0.36	0.43	0.45	0.33	-0.1	-0.2	0.23	0.04	0.20	0.28	0.25	0.37	0.43	0.46

n = 245-248 team leaders. Cronbach's alpha estimates are reported in italics along the diagonal for multi-item subscales.

TABLE B7

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CCL LOCATIONS

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