**Participative or directive leadership behaviors for decision-making in crisis management teams?**

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Keywords: leadership, teams, decision-making
Crisis Decision-Making

Teams today operate in multidisciplinary, dynamic, and complex environments that require speedy decisions based on incomplete information (Riolli-Saltzman & Luthans, 2001). This is especially true for crisis management teams in businesses, healthcare, and military organizations, for which theory and practical leadership guidance are sparse (Dinh et al., 2014; Hadley et al., 2011). On such teams, decision-making speed is critical (Cosgrave, 1996), because delays cause emergency situations to dangerously deteriorate. Decisions must also be accurate, requiring crisis management team members and their leaders to effectively integrate disparate knowledge and expertise (Hollenbeck et al., 1998; Humphrey et al., 2002). Yet, achieving both speed and accuracy at the same time is difficult for teams (Beersma et al., 2003). Therefore, understanding how leadership influences the accuracy and speed of decisions in crisis management teams holds practical significance as organizations increasingly invest in specialized crisis management teams (James & Wooten, 2010). We conceive of crisis management teams as a set of multidisciplinary experts brought together to coordinate their functional expertise with the purpose of determining how best to direct resources and activities in response to complex and dynamic situations that involve high time pressure and have high-stake consequences but may present incomplete information (Jobidon et al., 2017; van der Haar et al., 2017).

Leadership has a critical influence on teams (Kozlowski et al., 2016), accounting for large variance in team performance (e.g., Lorinkova et al., 2013; Martin et al., 2013). We expect leadership to also explain variance in the accuracy and speed of emergency team decisions for two reasons. First, team decisions are more proximal outcomes of team leadership than team performance (Sohrab et al., 2015) and, thus, likely more responsive to leadership behaviors. Second, teams make decisions in response to specific tasks or events whereas team performance often pertains to the aggregate outcome of multiple tasks over time.
While researchers acknowledge that leadership influences team decision accuracy (Sohrab et al., 2015) and speed (Vroom, 2003), there is surprisingly little theorizing or empirical evidence about the relative benefits of participative and directive leadership for team outcomes (Cheong et al., 2016; Pearce & Sims Jr., 2002; Sharma & Kirkman, 2015). Even fewer empirical studies have mapped the features that mitigate or enhance the effects of different leadership behaviors on the decision-making accuracy and speed of multidisciplinary teams (Schulz-Hardt & Mojzisch, 2012). This is especially true for crisis management teams, where the extent to which a decision task is unfamiliar (versus familiar) requires team members to interact and think in novel ways in order to arrive at accurate and speedy decisions (e.g., James, 2011).

Our study theorizes what forms of leadership are most effective in crisis management teams, an emerging area of leadership studies (Dinh et al., 2014), where the findings about the influence of leadership in emergencies are mixed (Hannah et al., 2009). We posit that such effects may depend on a key feature of emergency decision problems: the extent to which they are familiar to the crisis management team and associated with pre-specified courses of action.

Adopting a contingency theory of leadership as our theoretical framework, we theorize the relative influence of participative and directive leadership behaviors on the accuracy and speed of decisions that teams make in both familiar and unfamiliar emergency decision situations. We chose to compare participative and directive leadership because we seek to contribute and extend the ongoing conversation about the relative benefits of these two leadership behaviors on newly formed teams (Lorinkova et al., 2013; Martin et al., 2013). Participative leadership refers to the subset of empowering leadership behaviors that encourage members to voice their opinions and share information and that foster collective information processing and teamwork (Pearce et al., 2003; Spreitzer et al., 1999). Directive leadership, which is conceptually distinct from
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participative leadership (Yun et al., 2005), consists of behaviors that show team members the way, provide structure to the team, establish clear channels of communication, and seek to consolidate information (Pearce et al., 2003).

Our study makes several contributions to team leadership and team decision-making research on crisis management teams. First, by theorizing that directive and participative leadership behaviors improve distinct crisis management team decision-making outcomes (i.e., accuracy and speed), we contribute to the growing literature comparing the relative value of participative and directive leadership (Lorinkova et al., 2013; Martin et al., 2013). By explaining how the familiarity of a crisis management team’s decision task moderates the influence of leadership on crisis management team decision-making, our study further clarifies the relative advantage of unique leadership behaviors for team decision accuracy and speed. Second, our findings contribute urgently needed practical guidance to crisis management experts and trainers on the most effective behaviors for optimizing crisis management team decisions (Dinh et al., 2014; Hadley et al., 2011). Third, our empirical approach—an experimental crisis management simulation—contributes to team leadership theory by isolating the causal effect of leadership from other, potentially confounding factors (Antonakis et al., 2014).

Leadership, Decision Accuracy, and Speed

Our study compares the influence of participative and directive leadership on the accuracy and speed of crisis management team decisions, which, we were surprised to find, is only sparingly documented in published studies despite the longevity of the speed-accuracy distinction in psychology research on decision-making (Humphrey et al., 2002; Woodworth, 1899). We conceive of participative and directive leadership as team-level constructs inasmuch as team leaders predominantly exhibit these leadership behaviors in leading the team. We
conceive of the leader as an integral part of the team (Morgeson et al., 2010) rather than an independent decision maker. Thus, our approach agrees with both the conceptualization of team leadership and the emerging scholarship theorizing team leadership’s effects on team outcomes (e.g., Lorinkova et al., 2013; Martin et al., 2013).

Participative and directive leadership both shape team decision-making (Brodbeck et al., 2007). Some evidence shows empowering leadership, of which participative leadership is a critical component, to enhance team performance (Kirkman & Rosen, 1999; Lee et al., 2018) and directive leadership behaviors to hinder it (Moorhead & Montanari, 1986; Tetlock et al., 1992). Meyer and colleagues (2016), for example, found that when leaders empower their teams by asking questions (e.g., a participative leadership behavior), the quality of team decisions improves. Directive leadership, in contrast, is associated with groupthink (Janis, 1982). Yet, other studies show that participative leadership may backfire, for example, by burdening followers (Cheong et al., 2016), and that directive leadership sometimes enhances group decision-making processes (Kahai et al., 2004; Yun et al., 2005). Such mixed evidence suggests that contextual factors moderate the influence of leadership on team decision-making (Martin et al., 2013) and that this may also be the case in crisis management teams. Because accuracy and speed both characterize decisions but are not necessarily correlated, in a first step we isolate the influence of leadership on these distinct outcomes of decision-making. The effectiveness of leadership may further depend on the nature of the decision task itself (Durham et al., 1997).

Leadership and Decision-Making Accuracy in Crisis Management Teams

We propose that crisis management teams led with participative behaviors make decisions more accurately than crisis management teams led with directive behaviors because participative (more so than directive) leadership allows more information to surface and the information to be
more effectively integrated into a team decision. Our reasoning rests on prior evidence that participative leadership promotes information sharing (Kirkman & Rosen, 1999; Srivastava et al., 2006) and discourages premature closure in decision-making (Larson Jr. et al., 1998), thereby enabling synergistic thinking (DeChurch & Mesmer-Magnus, 2010), all of which should optimize decision-making accuracy. Because multidisciplinary teams require information sharing and collective thinking to make accurate decisions (Boone & Hendricks, 2009) under high time pressures, participative leadership is likely to be especially beneficial for crisis management teams (James & Wooten, 2010). This may be why participative leadership is correlated with better patient outcomes on multi-specialty trauma teams whose specialized knowledge needs to be rapidly integrated, yet are expected to quickly arrive at a comprehensive assessment of the patient’s injuries (Ford et al., 2016). Managing a crisis also requires improvisation, at which participative leadership may be more effective, to simultaneously create and implement plans (James & Wooten, 2010). Directive leadership, in contrast, seeks compliance (Sims Jr. et al., 2009), punishes deviates (Emans et al., 2003), and formalizes decision-making rules (De Hoogh et al., 2015), which restricts synergistic thinking (DeChurch & Mesmer-Magnus, 2010). Hence:

**Hypothesis 1**: Crisis management teams led by participative leaders make more accurate decisions than those led by directive leaders.

**Leadership and Decision-Making Speed in Crisis Management Teams**

We propose that crisis management teams led by leaders using directive leadership make speedier decisions than those led by leaders using participative leadership because directive leadership provides more structure and alleviates member cognitive overload more so than participative leadership. Directive leadership keeps members on track (Kahai et al., 2004), facilitates coordination, reduces task ambiguity (Pearce et al., 2003), and gets teams to more
speedily synchronize their thinking and behaviors than does participative leadership (Harrison et al., 2003). The rapid and proactive coordination provided by directive leadership may be critical to ensure speedy decisions in crisis management teams, because a crisis situation initially requires very concrete steps and basic coordination of activities (Tschan et al., 2006). In contrast, on teams with participative leaders, members may talk with each other more frequently and longer (Larson Jr. et al., 1998), and experience more cognitive overload (Magni & Maruping, 2013) than on teams with directive leaders. For example, participative medical leaders tend to approach cardiac arrest situations by assessing the incident with input from team members, asking questions about the patient and ensuring that the relevant expertise is shared on the team (Tschan et al., 2006). Production blocking may further delay decisions in teams with participative leaders because, when one person speaks, other members may be blocked from contributing, or may forget their own ideas (Diehl & Stroebe, 1987) and, therefore, the team may need more time for each member to express their views before the team can come to a decision. When leaders encourage team members to speak their minds – which participative (more so than directive) leaders tend to do – the team needs more time to retrieve members’ input. Hence:

**Hypothesis 2**: Crisis management teams led by directive leaders make speedier decisions than those led by participative leaders.

**Emergency Familiarity as Moderator of Leadership Behaviors’ Relative Effects**

Crisis management teams’ familiarity with an emergency is likely to moderate the relative benefits of participative and directive leadership for decision accuracy and speed. Crisis management teams are trained to expect and handle many sorts of crises but cannot be prepared for every contingency (Kaplan et al., 2013). Thus, depending on their training and experience, crisis management teams will be more familiar with some types of crisis than with others.
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Familiar emergencies have a low variability, are known to the crisis management team, recur with some predictability and contain pre-specified courses of action so that team members can draw upon their knowledge and experience to rapidly identify solutions (Lei et al., 2016).

Unfamiliar decision-making problems, in contrast, do not conform to known situations, require improvisation and a complex, collective problem-solving approach (Fox & Ochoa, 1997; Kaplan et al., 2013; Waller, 1999; Wang et al., 2014). For example, a utility company’s crisis management teams are more familiar with gas leaks than with large-scale infrastructure failures.

To ensure high quality decisions, crisis management teams, because of their multidisciplinarity, require members not just to share information, but also to help each other interpret and apply it (Rentsch et al., 2010). This sense-making capability is crucial when crisis management teams face unfamiliar situations, which require co-creating an understanding of the situation (van der Haar et al., 2015) by combining each member’s unique knowledge with that of others to develop an integrated action plan and anticipate joint outcomes (Endsley, 1995). It follows that leaders’ sense-giving role (Smircich & Morgan, 1982) is vital when decision-making problems are unfamiliar (Weick et al., 2005), but sense-making may look different based on leaders’ behaviors, with consequences for crisis management teams.

**In Unfamiliar Emergencies, Participative Leadership Further Improves Team Decision Accuracy (Relative to Directive Leadership)**

We theorize that the difference in decision accuracy between teams led with participative, compared to those led with directive leadership is wider for crisis management teams dealing with unfamiliar (versus familiar) task decisions because when tasks are unfamiliar, achieving accuracy requires identifying who has the relevant knowledge as well as sharing, making sense of and recombining dispersed, unique knowledge, which are more likely to exist when leaders
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employ participative behaviors.

First, leaders who use participative behaviors can more easily locate and integrate hitherto unknown expertise among the members of crisis management teams, which represent multiple disciplines, than they would be able to do with directive behaviors. Crisis management teams facing unfamiliar decision-making problems may lack cues to trigger knowledge stored among members (Schraagen & van de Ven, 2008). Unfamiliar situations also constrict team information flows (Gladstein & Reilly, 1985) leading unshared information to be suppressed or overlooked (Schulz-Hardt & Mojzisch, 2012). Consequently, leaders need to retrieve information from team members by encouraging them to speak up and to share unique insights, consulting with members and valuing their opinions (Wang et al., 2014), which all are participative behaviors.

Second, participative leadership is more likely than directive leadership to create team processes for information sharing and the recombination of knowledge (Harrison et al., 2003; Kirkman & Rosen, 1999; Srivastava et al., 2006). When an emergency decision does not fit a pre-existing pattern, there is no executable script to rely on and, thus, no known or identifiable response (Sommer & Pearson, 2007). Accordingly, achieving accuracy requires not just that team members participate in the decision-making process and share unique information they may possess (De Dreu et al., 2008; Waller, 1999; Wang et al., 2014) due to the multi-disciplinary nature of the team, but also that they engage in collective information processing (Waller, 1999; Wang et al., 2014), reconfiguring new and unexpected information to generate an optimal decision (Jehn, 1995). In contrast, teams led with directive behaviors tend to have established norms of structured decision-making, communication, and information consolidation but not team skills, capabilities, and cognitions for collaborative learning, collective information processing, and adapting to unfamiliar situations (e.g., Burke et al., 2006).
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Third, leaders facilitate inter-subjective sense-making when they empower (Patriotta & Spedale, 2009) rather than direct others. To solve unfamiliar emergencies, crisis management teams, because they are multidisciplinary, depend on collective, inter-subjective sense-making (Uitdewilligen & Waller, 2018; Weick, 1993). Communication among team members, encouraged by participative leadership, helps teams develop shared interpretive schemes and prepares them to handle uncertainty (Weick, 1993). In contrast, directive leaders may “narrow perception and heighten habitual response” (Weick, 1995, p. 86), as they tend to “construct reality through authoritative acts” (Weick, 1995, p. 31), interpreting the situation for their team members (e.g., Morgeson et al., 2010). Hence:

**Hypothesis 3**: The effect of leadership behaviors on decision accuracy is moderated by task familiarity, in such a way that the greater accuracy associated with participative leadership (over directive leadership) in crisis management teams is even more pronounced when task decisions are unfamiliar compared to when they are familiar.

**In Familiar Emergencies, Directive Leadership Further Increases Team Decision Speed** *(Relative to Participative Leadership)*

We theorize that the quicker decision-making predicted for directive (over participative) leadership is even quicker for crisis management teams dealing with familiar task decisions than for those in unfamiliar ones, because familiar emergency decision-making requires less information processing than unfamiliar decision-making and can rely on pre-specified courses of action (Leonard & Howitt, 2012).

Directive leadership keeps members on track (Kahai et al., 2004), facilitates coordination (Pearce et al., 2003; van der Haar et al., 2017), and gets team members to synchronize their thinking and behaviors more speedily (Harrison et al., 2003). Further, in familiar emergency
situations, substantial debate before coming to a decision is not just unnecessary (Gladstein, 1984; Magni & Maruping, 2013), but may also interfere with existing procedures (De Dreu & Weingart, 2003; Jehn, 1995). Familiar situations require only the sharing of information but not necessarily its collaborative processing (De Dreu et al., 2008). Rather, team members can draw upon their knowledge and experience to rapidly identify solutions (Lei et al., 2016). Sommer and Pearson (2007) have shown that when decision makers develop habits through practice and experience, they can more speedily find a satisfying solution to problems than if they had not developed habits. Therefore, directive leaders, who act with minimal consultation (Yun et al., 2005), can speed up the team decision-making considerably when the decision-tasks are familiar. In contrast, in unfamiliar emergencies, teams led by directive leaders find their established decision-making rhythm disrupted (Harrison et al., 2003) by the search for novel solutions and are unable to speedily adapt to the discontinuity in their established processes. Hence:

**Hypothesis 4:** The effect of leadership behaviors on decision speed is moderated by task familiarity, in such a way that, the greater decision speed with directive leadership (as compared to with participative leadership) is even more pronounced in familiar task decisions than in unfamiliar ones.

**Method**

**Sample**

Two hundred sixteen undergraduate students from a Belgian military academy \((n=144)\) and a medium-sized Dutch university \((n=72)\) participated in our study. Participants in both samples were intrinsically motivated to participate in a crisis management simulation: the Belgian Military Academy participants anticipate crisis management to be one of their central responsibilities, since the military is often a first responder when a natural or man-made disaster
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occurs. Incidentally, role-playing is a central training pedagogy in military academies such as the
one we sampled from. In our university sample, participants were enrolled in an elective course
on crisis management. Hence, the task was highly relevant for all participants, who consistently
indicated perceiving it as a highly engaging task. Video-recordings further shows that all teams
took the task very seriously and did their best to optimally perform.

Participants ranged in age from 18 to 29 years ($M = 22.08$, $SD = 1.84$) and 73% were male
(the military academy sample was 81% male, and the university sample was 54% male). We
divided participants into 72 three-person teams and had each team participate in four scenarios ($k = 288$). We tested the teams in separate experimental sessions, which lasted on average two
hours, and were incorporated into existing courses. Participants received neither course credit nor
payment for their participation.

Task overview

The crisis management simulation exposed participants to an emergency decision task that
required the integration of commonly and uniquely held information to make an accurate
decision about how to respond to the emergency. First, we randomly assigned all participants to
teams. Next, we organized each team into a two-level hierarchy comprising a formal team leader
(fire brigade commander) and two subordinate staff members (a police officer and a chemical
specialist). To do so, we followed Lorinkova et al. (2013) and, within each team, allocated the
formal team leader role based on our assessment of each team member’s preferred leadership
behavior as described below in the leadership manipulation section. This method ensures that the
treatment conditions best reflected leaders’ predispositions for participative and directive
leadership, while also maintaining all participants’ (including the leader’s) random assignments
to teams and to experimental conditions. Finally, once the team leader role was allocated, all
other participants were randomly assigned to the two staff member roles within teams.

All teams responded to four experimental emergency scenarios (within-team factor), two of which were ‘familiar’ conditions and two of which were ‘unfamiliar’ conditions. All scenarios required the functional knowledge of each of the three roles to come to an accurate decision. In addition, each team member possessed the same amount of expertise as the other team members and the expertise they possessed had equal importance for coming to a collective decision. For instance, each team needed the functional expertise of the chemical advisor (to determine the chance that an adjacent building would catch fire), of the police officer (to determine whether buildings would need to be evacuated), and of the firefighter (to determine the assignment of firefighting units to extinguish fires or evacuate buildings). To ensure consistency in how the information was distributed, the firefighting expertise was always located with the team leader. Before each experiment began, teams were explicitly reminded that they had to collectively make speedy but accurate decisions.

Procedure

The experimental procedure followed four distinct sequential steps: leadership manipulation, individual instructions and practice, team training, and the four experimental emergency scenarios. Each step is described in more detail below.

Leadership Manipulation

Consistent with Lorinkova and colleagues (2013), and because preferences for directive or participative leadership have a dispositional source (Li et al., 2018), we manipulated leadership after all participants were randomly assigned to teams, using a two-step approach, consisting of a selection and a training step, to maximize the effectiveness of the manipulation. First, we randomly assigned each of the teams to either the participative leadership condition ($N=36$), or
the directive leadership condition \((N=36)\). Then, within each team, we assigned the team member with the highest score on the respective leadership style to become the leader. A week before each experimental session, participants took a 20-item online questionnaire (Lorinkova et al., 2013), which we used to determine their preferred leadership behavior. Participants indicated whether, and the extent to which, they felt more comfortable performing participative leader behaviors or directive leader behaviors. We selected the participants with the highest participative scores within their team to serve as team leaders in the participative leadership condition \((N=36)\), and participants with the highest directive scores within their team to serve as team leaders in the directive leadership condition \((N=36)\).

The second step of the manipulation was a short leadership training. Prior to commencing the experiments, the experimenter provided the leaders with instructions regarding their specific leader role. The instructions contained information about the behaviors that we expected the leaders to exhibit during each of the scenarios, as well as a suggested list of verbal prompts for them to use in interaction with team members. Next, the experimenter showed the leaders a five-minute movie scene illustrating the desired leadership behaviors. The scenes were from “Cube” (participative leadership manipulation) and “Apollo 13” (directive leadership manipulation). To ensure that the leaders understood their roles, the experimenter pointed out specific leadership behaviors in the movie scenes that exemplified the leadership that the leaders would assume.

**Individual Instruction and Practice**

The experimenters also trained each team member on their role prior to the beginning of the simulation. Specifically, each member was trained in their specific role and functional expertise within the simulation (e.g., chemical advisor, police officer, and firefighter). Team members received information and formulas related to their specific role and several questions to
guide them through their training and assess their role understanding. For instance, chemical
advisors had information about the different chemicals that could be involved in the scenarios
and decision rules about when and how the presence of the chemicals could increase fire hazards.

Fire commanders learned how to calculate the required extinguishing capacity, to calculate the
damage costs to the buildings, and to determine whether they should go inside a building. Police
officer learned rules for deciding which routes should be closed, for calculating the chance that a
building would collapse, and for deciding what buildings should be evacuated. Participants read
their respective instruction sheets, reviewed a map to help them to visualize the disaster zones
pertaining to their emergency scenarios, and completed individual training tasks, which included
answering guided questions intended to clarify what kind of judgments they should make. When
needed, the experimenter assisted participants with correctly answering the practice questions.

**Team Training**

In the team training session, we gave teams two tasks, each under the condition of a
‘familiar’ situation. The teams had fifteen minutes to complete the first task and ten minutes to
complete the second one. After each task, members briefly reflected on how they performed as a
team. The experimenter did not intervene during the training tasks. Working on the training
scenarios and evaluating their performance during the reflection periods allowed team members,
and, in particular, team leaders, to discover the specific goals, tasks, and responsibilities of each
member and how the team should respond to emergency situations under the condition of a
‘familiar’ situation. Upon completion of the two training scenarios, the teams were considered
prepared to deal with familiar situations.

**Experimental Scenarios**

All teams completed four experimental emergency scenarios, two familiar ones and two
unfamiliar ones. In each scenario team members received information regarding the time of the incident, the location and intensity of the fires, wind direction and strength, the different chemicals involved, structural characteristics of the buildings, and the number of people per building (the last three information aspects were distributed across the team members). In order to come to an optimal solution, the role expertise of the members would need to be combined with this scenario-specific information and integrated with the knowledge of the different team members. For most judgments, a suboptimal response from one team member could create a negative cascading effect on others’ judgments, causing a team to perform suboptimally. This is because decisions often required trade-offs. For instance, applying units to evacuate buildings entailed that these units could not be used to help extinguish fires in other buildings. Familiar scenarios had conditions very similar to those in the training scenarios, enabling teams to rely on pre-specified decision routines (e.g., first determining which buildings should be evacuated, second deciding how many units were needed for extinguishing and evacuation, and then closing roads to make the units available). Unfamiliar scenarios involved conditions that the team had not previously experienced (e.g., much larger than usual quantities of chemicals involved; absence of one of the resources they had come to count on during practice; unexpected impossibility to extinguish all fires, requiring the need to prioritize) and for which the teams had not developed a decision-making protocol. To prevent order effects, we presented the familiar and unfamiliar scenarios in random order, resulting in a counterbalanced experimental design. Mirroring the amount of time that nuclear power plant control teams (Stachowski et al., 2009), medical trauma teams (Härgestam et al., 2016), and emergency management command-and-control teams (van der Haar et al., 2015) need to come to a shared understanding of and initial plan of action for an emergency, the teams in our study had a maximum of 10 minutes to work
on each scenario, after which the team leader recorded the team decision. When teams in our study faced the familiar condition, only 4.2% used the full 10 minutes to decide; in contrast, when the teams faced an unfamiliar scenario 30.6% used up the allocated time.

**Measures**

*Perceived leadership behavior.* Team members filled out surveys assessing their perceptions of their leaders’ behavior after each experimental emergency scenario. Using six items adapted from Lorinkova and colleagues (2013), team members evaluated the extent to which their team leader behaved in a participative or in a directive way (from 1 = Strongly disagree to 5 = Strongly agree). Cronbach’s alphas were .89 (participative leadership) and .92 (directive leadership). We assessed within-team agreement by calculating $r_{wg}$, using the expected variance of a 5-point scale with a uniform null distribution ($\sigma_{EU}^2 = 2$) (James et al., 1984). The mean $r_{wg}$ across scenarios was .84 for participative leadership and .88 for directive leadership. Both values exceed the conventionally acceptable value of .70, indicating high interrater agreement (LeBreton & Senter, 2008).

*Perceived emergency familiarity.* We developed a five-item questionnaire to measure the team members’ perceptions of the degree of emergency familiarity of the scenarios. Team members indicated to what extent the present scenario differed from scenarios performed during their training sessions on a scale from 0 (no difference) to 100 (very different). A sample item is, “How different from the training sessions did you consider this scenario to be?” The Cronbach’s alpha was .74. We assessed within-team agreement with the $r_{wg}$-index (James et al., 1984), using an expected random variance and the formula ($\sigma_{EU}^2 = \frac{A^2 - 1}{12} = 850$), with $A = 101$ (James et al., 1984). The mean $r_{wg}$ was .81 for both familiar and unfamiliar situations, suggesting strong agreement among team members (LeBreton & Senter, 2008).
Decision accuracy and speed. The team decisions included the type and number of emergency units to dispatch to which specific building, which roads to close leading to the emergency zone, whether to evacuate people from buildings, etc. We computed Decision accuracy with an algorithm specifically designed for each scenario as the costs a team incurred relative to the minimal amount of costs they would have incurred if they had made the optimal combination of decisions. In both routine scenarios, four teams reached the optimal solution and the average costs were 1.60 and 1.40 times higher than the minimal possible amount of costs. In the non-routine scenarios respectively five and two teams reached the optimal solution, and the average costs were 1.92 and 1.61 times higher than the minimal possible amount of costs. We converted the scores for each scenario to a score between 0 and 100 and then inverted the scores to facilitate interpretation (higher scores = higher accuracy). We operationalized Decision speed as the time needed to make a decision from the moment the teams were told to start reading the instructions until the moment the team leader finished entering the team decision. Team decision speed ranged from 111 to 600 seconds (i.e., the maximum time available to complete each scenario). To facilitate interpretation, we inverted the scores so that higher scores would reflect speedier decisions than lower scores.

Analytical strategy

We used a repeated measures design setup with four emergency scenarios nested within each team. Given the nested data structure, we used a two-level hierarchical linear modeling approach to test our hypotheses. The dependent (decision accuracy and decision speed) and moderating (emergency familiarity) variables were scenario (level 1) variables, whereas the independent variable (leadership behavior) was a team (level 2) variable. Thus, our hypothesis that emergency familiarity and leadership behavior interact in predicting decision accuracy and
speed is a cross-level interaction hypothesis (Klein et al., 1994). To estimate our models, we used the nlme package in R (version 3.0.3) (Bliese, 2016). We first built an intercept-only model (Null model) for the level-1 outcome variables (decision accuracy and speed) as a baseline model for subsequent analyses, indicating how much variance in accuracy and speed exists within and between teams. Next, we entered test location (Belgium = 0; Netherlands = 1) and leader gender (female = 1) into the equation as control variables. Then, we added leadership behavior (directive = -1; participative = 1) and emergency familiarity (unfamiliar = -1; familiar = 1), allowing the slope of familiarity to vary across teams (random-intercept, random-slope model) (LaHuis & Ferguson, 2009). After that, we entered the cross-level interaction of emergency familiarity and leadership behavior into the equation. Finally, we estimated the models using the full maximum likelihood estimation method to compare model fit. Our results are robust to how quickly teams completed their task: because some teams completed their tasks very quickly, one concern may be that these teams did not take the task seriously. Therefore, we ran all our analysis both with and without the teams (n = 46) that completed the task in under 5 minutes. The pattern of results was consistent for the two samples: all effects remained significant and in the same direction.

Results

Manipulation Checks

Leadership Behavior. To assess the validity of the leadership manipulations, we trained two coders, who were blind to the experimental conditions, to independently judge the leadership behaviors in the videotaped experimental sessions (n = 45). The coders assessed the leadership behaviors with Lorinkova and colleagues’ (2013) leadership scale. When independent coders agreed that the leader “took charge of the team,” “gave instructions to the team members,” and “required team members to follow instructions,” we classified the leader as directive. When they
concurred that the leader encouraged team members “to express ideas/suggestions,” “to assume responsibilities on their own,” and “to search for solutions to problems on their own initiative,” we classified the leader as participative. Cronbach’s alphas were .78 (directive leadership) and .72 (participative leadership). The mean interrater agreement index $r_wg$ (James et al., 1984), calculated using a uniform null distribution ($\sigma_{EU}^2 = 2$), was .81 for directive and .92 for participative leadership, indicating high interrater agreement (LeBreton & Senter, 2008). The $t$-test confirmed that leaders in the directive condition ($M = 3.86, SD = 0.49$) displayed more directive behaviors than leaders in the participative condition ($M = 3.59, SD = 0.34$), $t(43) = 2.15, p = .038, d = .64$. The results also indicated that leaders in the participative condition ($M = 3.72, SD = 0.33$) exhibited significantly more participative behaviors than those in the directive condition ($M = 3.51, SD = 0.22$), $t(43) = -2.22, p = .032, d = .64$.

We also considered whether team members perceived the differences in leadership behaviors and whether their perceptions of the leader’s behaviors were consistent over the course of the experiment, that is, across familiar and unfamiliar scenarios. Because we measured members’ leadership perceptions four times during the experiment (i.e., at the completion of each scenario in the experiment), we conducted the validity assessment using multilevel analysis, with scenarios embedded in teams. The results show that participants in the directive leadership condition ($M = 3.97, SD = 0.42$) always perceived the team leader to be significantly more directive than did the participants in the participative condition ($M = 3.55, SD = 0.59$), ($\gamma = -0.20, t = -3.37, p = .001$), whereas there was neither a main effect of situation familiarity ($\gamma = 0.02, t = 0.72, p = .472$) nor an interaction effect between situation familiarity and the leadership manipulation in predicting perceived directive leadership ($\gamma = -0.00, t = -0.01, p > .990$). Teams in the participative ($M = 3.80, SD = 0.43$) and directive conditions ($M = 3.77, SD = 0.42$) did not
significantly differ in the extent to which they perceived their leader to use participative behaviors, \( (\gamma = 0.16, t = 0.32, p > .753) \) and there was neither a main effect of situation familiarity \( (\gamma = 0.05, t = 1.81, p = .071) \) nor an interaction effect between situation familiarity and the leadership manipulation in predicting perceived directive leadership \( (\gamma = 0.01, t = 0.22, p = .827) \).

Because our independent coders were trained to recognize the two leadership behaviors and watched all videotaped teams, paying close, “real time” attention to leader behaviors, we consider that they provide more objectively and consistent determination of leaders’ behaviors (Waller & Kaplan, 2018) than participants (whose survey responses were retrospective evaluations of leader behaviors), supporting the validity of the leadership manipulations.

Finally, to assess whether the selection of the leader from within the team could have affected the distribution of the followers’ leadership preference scores, we compared followers’ leadership preferences between the two conditions. An independent \( t \)-test showed no difference between the conditions on the directive preference scores (Mean directive condition = 4.89, Mean participative condition = 4.85, \( t = .707, p = .482 \)) or on the participative preference scores (Mean directive condition = 5.14, Mean participative condition = 5.19, \( t = -.420, p = .675 \)).

**Emergency familiarity.** The results of the \( t \)-test indicate that the participants perceived the unfamiliar scenarios \( (M = 62.33, SD = 10.94) \) to be significantly more different from the training scenarios in comparison with the familiar emergency scenarios \( (M = 28.76, SD = 9.08) \), \( (t(142) = 20.29, d = 3.38, p < .001) \) indicating that the emergency familiarity manipulation was effective.

**Preliminary Results**

Table 1 presents descriptive statistics and inter-correlations among the variables in the study. Leadership behaviors and decision speed are negatively correlated, suggesting that
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directive leadership behaviors bring about speedier decisions. Decision accuracy and decision speed are both positively correlated with familiarity, meaning that when dealing with familiar decision-making tasks, team members make speedier and more accurate decisions than when dealing with unfamiliar decision-making tasks. Finally, decision accuracy and decision speed correlate positively. As this seemed contrary to what we know about decision-making we conducted further analyses (not reported here but available upon request), revealing that the correlation is only statistically significant in familiar situations (but not in unfamiliar situations): both decision accuracy and speed were higher in the familiar scenarios. When testing a partial correlation, controlling for scenario familiarity the effect is significantly reduced ($r = .124, p = .036$).

Before testing the hypotheses, we ran intercept-only models to examine whether there was systematic between-team variance in the dependent variables. We used ICC(1) as an index of non-independence for the dependent variables (Bliese, 2016). For decision accuracy, ICC(1) was .11, $F(71, 216) = 1.52, p = .012$; for decision speed, it was .09, $F(71, 216) = 1.38, p = .041$. These values indicate that there is a substantial amount of between-team variance in the dependent variables (LeBreton & Senter, 2008). The results are shown in Tables 2 and 3.

Test of Hypotheses

First, we examined the main effects of leadership behavior on decision accuracy (Hypothesis 1) and speed (Hypothesis 2). Table 2 (step 2) shows that leadership behaviors did not have a significant main effect on decision accuracy, failing to support Hypothesis 1. Table 3, step 2 shows that leadership behaviors have a significant main effect on decision speed: teams
where leaders used directive behaviors made their decision more speedily than teams where leaders used participative behaviors, supporting Hypothesis 2.

Next, we examined the interaction effects between leadership behavior and emergency familiarity on the two outcome variables. We predicted (Hypothesis 3) that the greater accuracy associated with participative leadership (over directive leadership) in crisis management teams is even more pronounced when task decisions are unfamiliar compared to when they are familiar. Supporting Hypothesis 3 (Table 2, step 3) leadership and emergency familiarity interacted in predicting decision accuracy ($\gamma = -6.00, p < .001$). To clarify our results, we also conducted simple $t$-tests comparing the teams’ average accuracy between teams with a directive and teams with a participative leader. These results show that in non-familiar situations, teams with participative leaders make more accurate decisions than teams with directive leaders ($t = -2.091, df = 70, p = .040$), whereas in familiar situations, teams with directive leaders make more accurate decisions than teams with participative leaders ($t = 3.492, df = 70, p < .001$). Figure 1 (A) illustrates the interaction effect. By adding the cross-level interaction of emergency familiarity and leadership the model improved significantly ($\Delta -2x \log = 19.69, \Delta df = 1, p < .001$).

Hypothesis 4 predicted an interaction effect between leadership behaviors and decision task familiarity on decision speed, such that teams led with directive behaviors make speedier decisions than teams led with participative behaviors, and more so in familiar decision-making.

http://mc.manuscriptcentral.com/sgr
tasks. Supporting Hypothesis 4 (Table 3, step 3) leadership behaviors and emergency familiarity interacted in predicting decision speed ($\gamma = -13.26, p < .013$). Further, the model fit improved significantly when adding the cross-level interaction of emergency familiarity and leadership ($\Delta -2x \log = 6.14, \Delta df = 1, p < .013$). Simple $t$-tests show that in familiar situations, teams with directive leaders make their decisions faster than teams with participative leaders ($t = 3.475, df = 70, p < .001$); whereas speed of decision-making in non-familiar situations did not differ significantly at $p < .05$ ($t = 1.805, df = 70, p = .075$). We graph the effect in Figure 1 (B).

**Discussion**

Our study addresses the theoretical challenge of determining what forms of leadership are most effective in crisis management teams. We resolve ambiguities about the relative effects of participative and directive leadership with two central features of our theory: we examine their effects on teams’ decision-making accuracy and speed simultaneously; and we introduce as contingency the team’s familiarity with the emergency decision task. In doing so, our study is one of a small but growing number (Cheong et al., 2016; Pearce & Sims Jr., 2002; Sharma & Kirkman, 2015) identifying the conditions that mitigate or enhance the effects of different leadership behaviors on the decision-making accuracy and speed of multidisciplinary teams, focusing here on crisis management teams. We do so by using randomized experiments, an ideal research design in leadership studies (Antonakis et al., 2014), and a realistic crisis management simulation, with a sample of 216 undergraduate student teams, of which 144 teams are training in a Belgian Military Academy in preparation for roles that include crisis management.

**Theoretical Implications**

Our findings extend previous research in several ways. First, while evidence suggests that participative leadership is not advantageous in all contexts and to all followers (Cheong et al.,
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2016; Lee et al., 2018; Sharma & Kirkman, 2015), we add to the small number of studies that
directly compare the effectiveness of participative and directive leadership on team outcomes
(Lorinkova et al., 2013; Martin et al., 2013; Yun et al., 2005), focusing on crisis management
teams. Our findings from our laboratory experiment of a simulated crisis context confirm that
neither behavior is a priori better than the other. Participative leadership helps crisis
management teams to make more accurate decisions in unfamiliar emergency situations,
presumably by identifying who has the relevant knowledge, promoting the sharing of
information, and helping the team making sense of and recombine dispersed, unique knowledge.
But these leadership behaviors also appear to inhibit accuracy in familiar emergency decisions
and slow teams down in both familiar and unfamiliar emergency situations. In contrast, directive
leadership helps teams to rapidly identify solutions, but in the process of doing so, may hamper
decision quality, particularly when the decision tasks are unfamiliar. By offering fresh evidence
of the relative benefits and drawbacks of participative and directive behaviors for teams dealing
with emergency decision tasks, we encourage future research to explore how different leadership
behaviors affect team outcomes in emergency, crisis, and dangerous situations. We note that our
study focuses on what leaders actually do while interacting with their followers and not so much
on what they should do or typically do. As such, our study evaluates the effect of leaders’
behaviors while interacting with their followers (Hannah et al., 2014). A focus on leader
behaviors is helpful because it “creates a better understanding of how leaders can draw from a
host of potential behaviors from multiple models of leadership, and how these models are more
or less effective across time and context” (Hannah et al., 2014, p. 602).

Second, our study advances contingency leadership theory by identifying teams’
familiarity with an emergency decision as a key condition that moderates the effects of
participative and directive leadership on crisis management decision-making, in a simulation setting. The findings of our study on simulated crisis management teams may also apply more broadly to teams not specifically trained to tackle, but nevertheless likely to face emergencies (e.g., top management teams, board of directors.) For example, pharmaceutical and medical devices firms regularly face product recalls, which are emergency situations: recalls may be familiar (e.g., in the extent of their negative impact and the scope of products affects) or unfamiliar (e.g., resulting in fatalities or very large in scope). On top management teams facing such recalls, the CEO’s leadership behaviors may affect the correctness of the recall decision and the speed at which it is initiated.

Third, we advance research on the relevance of two team decision outcome characteristics, accuracy and speed. Studies examining the effects of participative and/or directive leadership tend to focus on overall team performance as an outcome, with mixed results (Cheong et al., 2016; Kahai et al., 2004; Yun et al., 2005). Our findings suggest that a single leadership behavior may have opposite effects on the distinct performance outcomes of accuracy or speed, thereby highlighting the importance of distinguishing between various decision-making performance indicators in evaluating the effectiveness of various leadership behaviors.

Fourth, our empirical approach—an experimental emergency management simulation—contributes to the contingency approach to leadership theory by isolating the effect of leadership from other, potentially confounding factors. As such, it contrasts with leadership studies that do not correct for endogeneity issues. Our study, therefore, helps advance leadership research by ruling out endogeneity as an alternate explanation for leadership effects (Antonakis et al., 2014).

**Practical Implications**

Our findings suggest at least three strategies for organizations seeking more accurate and
speedier decisions from their crisis management teams. First, teams may be staffed with predominantly participative or directive leaders depending on the characteristics of the situations they face (directive for teams facing more familiar situations and participative for teams facing more unfamiliar situations). This approach has the benefit of stability: team members will know what to expect from their leaders; however, it may lead to suboptimal functioning in situations that require leadership behaviors that are contrary to the team leader’s preferred behavioral approach. This may occasionally lead to high costs; for instance, a directive leader on a team that is unexpectedly faced with a complex crisis may lead to low-quality decision outcomes.

Second, since crisis management teams face a variety of situations, team leaders should be trained to adaptively switch between leadership behaviors (Klein et al., 2006; Yukl & Mahsud, 2010). Several scholars have pointed out the pivotal role of leadership in teams adapting to different situations (e.g., Burke et al., 2006). While teams, when led with participative behaviors, may be capable of adapting their processes (e.g., communication, coordination, and cognition) during unfamiliar events, the same may not be true for teams led with directive behaviors. Therefore, if team leaders can adjust their behavior to situational demands, teams should benefit.

Third, for leaders to adjust their behavior to best fit the situational demands, they first need to be able to correctly assess the situation. People have the tendency to search for and interpret information in a way that supports one’s existing beliefs (Nickerson, 1998). Therefore, one could expect many crisis teams to exacerbate their own crisis situations by combatting the crisis with the mistaken belief that it is a familiar situation and can be managed with rote directive leadership, only to realize too late that the situation is fundamentally different and should be approached with a more empowering/participative leadership strategy.¹ Weick’s (1993) account

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¹ We are indebted to one of our anonymous reviewers for this insight.
of the Mann Gulch disaster is a telling example of erroneous group decision-making due to inaccurate situational awareness. Given all the biases that lead us to want to believe a situation is more familiar than it actually is, our results should at a minimum stimulate emergency management crisis trainers – but potentially also encourage firms that rely on such teams – to help teams recognize those situations with more unfamiliar patterns of parameters. Crisis management teams operating in complex and dynamic environments are advised to develop their situational awareness as enhanced levels of situational awareness will help leaders to adopt the leadership behaviors that best fit the team’s emergency decision task.

Limitations and Suggestions for Future Research

Like any research, our study has limitations that also present opportunities for future research. First, our sample comprises only undergraduate students, most of them men. While student subjects are not inherently problematic in experimental research (Druckman & Kam, 2011), future studies may seek to replicate our work with a gender-balanced sample of working adults in crisis management teams. Also, while in this study the focus was on emergency decision-making in crisis management teams, future research may want to investigate whether similar results occur with other types of multidisciplinary teams (e.g., top management teams) facing emergencies. Such research could clarify how our findings about the effects of participative and directive leadership may differ across team characteristics (e.g., distributed versus shared knowledge) and context (e.g., loss of lives versus loss of capital).

Second, while our independent coders, blinded to our experimental conditions, reported differences in the behaviors of leaders in the directive and participative conditions, team members themselves did not significantly differ in the extent to which they rated their leader as using participative leadership behaviors. This inconsistency could stem from response biases,
which are more likely to cloud participants’ than independent coders’ ratings of leader behaviors (Gioia & Sims, 1985; Podsakoff et al., 2003). According to implicit leadership research, individuals’ idiosyncratic beliefs about leadership color how they respond to surveys retrospectively asking about their leaders’ behaviors (Feldman, 1981). The discrepancies between recollected and actual leader behaviors are not trivial and increase with individuals’ knowledge about the leaders’ prior performance (Martinko et al., 2018). Hence, our observational method of assessing the leadership manipulation likely provides a more accurate, bias-free check of the leadership behavior manipulation. In addition, independent coders (but not the team members) were trained to recognize relevant leadership behaviors and watched all videotaped teams. With this frame of reference, they could more objectively judge each leader’s behaviors (Waller & Kaplan, 2018).

Third, while our experimental design, which relied on a sample of teams performing a realistic crisis management exercise, helped us to reduce endogeneity, this comes at the expense of capturing the complexity of real-world decision-making problems. One inherent drawback of an experimental design with dichotomous variables is that it does not allow us to draw conclusions on the exact minimum and maximum level of the variables at which our effects will occur. Moreover, while we draw on parameters from real crisis management teams to construct the simulation, our experiment may not entirely capture the experience of real-world crisis management teams (Kleinmuntz & Thomas, 1987) that confront dynamic problems and must continuously adapt to ever-changing circumstances. In addition, real-world emergency decision tasks likely sit somewhere along a continuum from high to low familiarity, rather than squarely qualify as familiar or not. Also, research has revealed that effective leaders are not limited to one leadership behavior but use several types of leadership behaviors (Yukl & Mahsud, 2010). That
is, leaders may switch back and forth from directive to participative leadership and vice versa. Future research may, thus, benefit from longitudinal designs wherein real crisis management teams confront emergencies that evolve over time from familiar to unfamiliar decision-making problems (or vice versa) and wherein leaders are not constrained to use only one set of leadership behaviors.

Fourth, we did not consider leadership experience as a decisive variable in our study. However, experience is an important prerequisite for accurate decision-making in familiar situations since leaders must be able to use previously compiled knowledge to determine how useful a solution to the problem might be (Fox & Ochoa, 1997). All teams and team members received the same training for dealing with routine emergency situations. Future research could examine whether our findings hold when team leaders and members vary in level of experience. Moreover, although in our sample teams were randomly assigned to conditions, within the teams the leaders were not randomly selected but assigned based on their scores on the pre-questionnaire. Although, this will not change the randomness of the composition between the groups, it could potentially change the distribution of disposition variables within the group, between the members and the leader.

Conclusion

This study reveals yet undocumented boundaries to the effects of participative and directive leadership for crisis management team decision-making performing a realistic crisis management exercise, extending previous research on the relative advantages and disadvantages of these leadership behaviors. We show that leadership has different effects on distinct aspects of crisis management teams’ decision-making (i.e., accuracy and speed) and that these effects depend on the team’s familiarity with the emergency decision task. Future studies that evaluate
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the mechanisms through which these leadership behaviors influence distinct performance outcomes of crisis management teams and of teams more generally would further contribute to contingency theories of leadership. We hope this study spurs interest in these issues.
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For Peer Review

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https://doi.org/10.1016/j.leaqua.2013.11.005


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**Table 1**

*Descriptive Statistics and Correlations*

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<th>Variables</th>
<th>Mean</th>
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<th>3</th>
<th>4</th>
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<td>-.22</td>
<td>-.21</td>
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<td>6. Decision speed</td>
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<td>.63***</td>
<td>-.09</td>
<td>-.05</td>
<td>.29***</td>
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</table>

*Note:* N = 72 for correlations with Leadership behavior, Task familiarity, and Leader gender (based on the average of the z-scores of Decision accuracy and Decision speed over the four scenarios); N = 288 for all other correlations. * p < .05, ** p < .01, *** p < .001. Leadership behavior is coded as: directive = -1; participative = 1, Task familiarity is coded as: unfamiliar = -1; familiar = 1, Leader gender is coded as: male = 0; female = 1.
Table 2

Mixed-Effects Models Predicting Decision Accuracy as a Function of Leadership Behavior and Task Familiarity

<table>
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<tr>
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<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
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<td>Estimate</td>
<td>SE</td>
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<td>82.62***</td>
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<td>-7.38*</td>
<td>(3.56)</td>
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<td>(1.38)</td>
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<td>∆ -2*LL</td>
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<td></td>
<td>22.18***</td>
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<tr>
<td>Df</td>
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<td>9</td>
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</table>

Note. N = 72, k = 288, ∆ = difference; SE = standard error; LL = log likelihood, * p < .05, ** p < .01, *** p < .001.
Leadership behavior is coded as: directive = -1; participative = 1, Task familiarity is coded as: unfamiliar = -1; familiar = 1, Leader gender is coded as: male = 0; female = 1.
Table 3

Mixed-Effects Models Predicting Decision Speed as a Function of Leadership Behavior and Task Familiarity

<table>
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<tr>
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<th>Step 2</th>
<th>Step 3</th>
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<td>(16.52)</td>
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<td>81.45***</td>
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</table>

Note. N = 72, k = 288, \( \Delta \) = difference; SE = standard error; LL = log likelihood, \( * p < .05, ** p < .01, *** p < .001 \). Leadership behavior is coded as: directive = -1; participative = 1, Task familiarity is coded as: unfamiliar = -1; familiar = 1, Leader gender is coded as: male = 0; female = 1.
Figure 1

*Interaction of Leadership Behavior and Decision Task Familiarity (vs Unfamiliarity) Predicting Team Decision Accuracy (A) and Speed (B)*