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Mood at the Midpoint: Affect and Change in Exploratory Search Over Time in Teams That Face a Deadline

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The purpose of this paper is to advance the team dynamics and group development literatures by developing and testing a theoretical model of how affect shapes transitions in teams over time. Integrating the group transitions literature with theory and research on the mood-as-input theory, I propose that shared team mood influences the extent to which team members seek out and experiment with alternative ways of completing their work at different points in a team's life. In the first half of the team's life, when team members are relatively task-focused, I argue that team positive mood (i.e., a positively valenced affective state shared by team members at a given point in time) stimulates, whereas team negative mood (i.e., a negatively valenced affective state shared by team members) suppresses, exploratory search. At the temporal midpoint, however, when team members' focus on performance heightens, team positive mood acts as a shutoff switch for search, leading to a decline in exploratory search over the second half of the team's life. Team negative mood at the midpoint, on the other hand, leads team members to persist in exploratory search, even as a deadline draws near. A team's trajectory of exploratory search over time, I propose, influences team performance such that it is highest when teams engage in high exploratory search early in the team's life and decline in exploratory search over the second half of the team's life. The results of a longitudinal, survey-based study of teams preparing for a military competition largely support my predictions.

Keywords: affect; mood; pacing; team development; exploration; group dynamics
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Introduction

Each Monday, a team gathers at 30 Rockefeller Plaza in New York City to begin the six-day process of creating an episode of *Saturday Night Live* (*SNL*)—a sketch comedy show that has aired live on television since 1975 (Shales and Miller 2002). Throughout the first half of the week, the show's writers, performers, and guest host explore sketch ideas in brainstorming sessions, pitch meetings, and writing marathons. On Wednesday evening—when half of the week has passed—the cast, crew, and producers meet to read through more than 40 sketch ideas and decide which 10 or so have the potential to air on Saturday night. In the second half of the week, the team rewrites and rehearses the chosen sketches, hoping for a well-executed performance on Saturday night (Mohr 2004).

Like the *SNL* crew, organizational teams often must prepare for key performance events. Indeed, for many teams, a specific performance event is defining. Consider a marketing team charged with developing and delivering a product launch presentation at a major industry event. What this team does at a specific point in time—during its presentation to industry insiders—determines, in large part, the team's success. Scholars call such teams *performing teams*—action teams that prepare for a performance event that occurs at an a priori scheduled time (Ishak and Ballard 2012). With their scheduled performance event, such teams face unique temporal challenges. Team members must spend time and energy searching for exceptional ways to meet their goals. For example, the members of the marketing team must dream up how to open and structure their presentation and brainstorm use cases that will resonate with the audience. There comes a time, though, when searching for and experimenting with alternatives likely detracts from team performance. Positive outcomes of search efforts are not guaranteed (Janssen et al. 2004, March 1991), and even if team members discover promising directions, it may take them significant time to fully integrate new ideas into the team's work (Ford and Sullivan 2004, Gersick and Hackman 1990).

Theory and research (e.g., Gersick 1988, 1989) suggest that team members facing a deadline use the passage of time—and, in particular, temporal milestones—to pace their work. Temporal milestones, such as the midpoint of a team's life, are times when groups are especially prone to break free of inertial patterns (Gersick and Hackman 1990) and potentially change in how much they focus on exploratory search (i.e., experimenting with new ideas and approaches to their tasks). Like the *SNL* crew, teams with a deadline are likely to

pause after they have used half of their time to evaluate their progress to date, identify performance gaps, and begin to narrow in how they approach their work (Gersick 1988, 1989; Waller et al. 2002). But although they may pause at the midpoint, some teams struggle to narrow in their task focus, persisting in a search for better solutions, even as the deadline draws near (Gersick 1991).

"What factors affect the success of groups' transitions?" More than 25 years after Gersick (1988, p. 34) posed this question, scant theory or research has examined why some teams decline in exploratory search after the midpoint while others persist in seeking new and better ways of accomplishing their tasks. Given that many teams face deadlines (Waller et al. 2002), and scholars have speculated that narrowing at the midpoint is critical for team effectiveness (Ford and Sullivan 2004, Gersick 1989), understanding the factors that influence change in exploratory search over time is important both theoretically and practically.

The purpose of this paper is to advance the team dynamics literature by proposing and testing a model of how teams facing a deadline change in their focus on exploratory search over time. Prominent in the model I propose is affect. Affect is central to theories in psychology (Carver and Scheier 1990, Simon 1967), neuroscience (Damasio 1994), and organizational behavior (George and Brief 1996) that explain how people regulate their behavior over time in the pursuit of goals. Individuals, these theories suggest, use their feelings when evaluating their progress on ambiguous tasks and adjust their actions accordingly. Integrating theory and research on affect with the group transitions literature, I argue in this paper that affect—how team members feel—is a mechanism that shapes change in exploratory search over time.

In developing predictions about affect and change in exploratory search over time, and testing my predictions in a longitudinal, survey-based study of military competition teams, I contribute to the literature in three ways. First, by viewing exploratory search as an activity that can change over time in teams, my research enhances scholars' understanding of team *dynamics*. Reflecting the dearth of change-focused research on teams more generally (Cronin and Weingart 2011), scant research has examined how teams might change over time in their focus on exploration (Anderson et al. 2004, West 2002). Second, my findings suggest that affect—specifically, team mood at the midpoint of a project—is a motor of change in exploratory search over time. My research thus advances understanding of transitions in teams that face a deadline and broadly contributes to growing interest in affect in teams, an area that Barsade and Gibson (2007) described as a promising front in the affective revolution in organizational behavior. Third, connecting these team dynamics to outcomes, my findings paint a nuanced picture of how exploration contributes to team performance. Knowing a team's pattern of exploratory search over time is important, I find, for discerning whether search enhances, or detracts from, team performance.

Team Mood and Change in Team Exploratory Search Over Time

March (1991) claimed, "The essence of exploration is experimentation with new alternatives" (p. 85). Building on March, I use the term *team exploratory search* to capture team members' intentional pursuit of alternative approaches to team tasks. When engaged in exploratory search, members seek new ways of completing their work and experiment with alternatives to determine whether changing their existing approaches might enhance team performance. Exploratory search fits within the broad construct space of team learning, which Edmondson et al. (2007, p. 304) described as a collection of processes that promote "positive change (created or intended by certain activities), whether in understanding, knowledge, ability/skill, processes/routines, or systemic coordination." Similar to other constructs identified by Edmondson et al. (e.g., reflexivity), exploratory search is part of the *process* of innovation. Although not widely used in the teams literature, I use the term "team exploratory search," rather than "team learning" or "innovation," for three reasons. First, performing teams must engage in rapid cycles of idea generation and implementation over time as they approach their deadline. Exploratory search fits well with this process of innovation over time. Second, notwithstanding process-oriented definitions of innovation (e.g., West and Farr 1990), the bulk of innovation research has treated innovation in teams as an outcome (Hülsheger et al. 2009). My focus is specifically on the process of innovation, with a view of exploratory search as a team activity that is dynamic. Third, a focus on exploratory search fits the work of Edmondson et al. and their call for precision in studying the processes of positive change in teams.

In this paper, I argue that team mood may influence how teams change in exploratory search over time. *Team mood* is the affective state that team members jointly experience at a given point in time (Kelly and Barsade 2001). Building on research on individual mood, a growing literature, sparked by George's (1990) research, has documented a strong tendency for group members to share affective experiences and for these experiences to influence group processes and outcomes (Barsade and Gibson 2012). This tendency for members to share affective experiences is, in part, due to the process of emotional contagion (Barsade 2002) through which members infect one another with their individual moods and a convergent, group-level mood emerges (Barsade 2002, Bartel and Saavedra 2000, Totterdell et al. 1998).

Team mood is thus an emergent, shared, team-level construct (Kozlowski and Klein 2000). Like individual-level mood, team mood is an affective state that is relatively mild in intensity and short in duration, lasting from a few hours to several days. And team mood is *diffuse*—it is a background state that is disconnected from its antecedent cause (Weiss 2002). Scholars frequently describe two dimensions of mood: valence and activation (Larsen and Diener 1992). However, in developing predictions about how mood influences goal-directed activity, scholars have focused mostly on the bipolar valence dimension—that is, "how pleasant (toward happy) or unpleasant (toward sad) the mood is" (Barsade and Gibson 2007, p. 37). Functional theories of mood (Martin et al. 1993, Schwarz 2012), which I rely on, presume that the valence of affective states evolved as a primitive signal of safety or danger. In developing predictions about how team mood influences exploratory search over time, I thus focus on the valence dimension, using the terms *team positive mood* and *team negative mood* to refer respectively to the positively and negatively valenced affective states that team members share at a given point in time.[1]

Team Mood as Input: How Mood Shapes Team Exploratory Search Over Time

Below, I theorize that team mood shapes a team's trajectory of exploratory search over time. To develop this argument, I integrate the mood-as-input model with the group transitions literature.

Mood-as-Input. The mood-as-input model is an extension of mood-as-information theory (Schwarz 2012; Schwarz and Clore 1983, 1996), which suggests that people use their mood to form evaluations or make judgments in ambiguous situations. Because mood is diffuse, people unconsciously attribute their feeling state to the target of evaluation. Hence, when feeling relatively positive (negative), people tend to view targets positively (negatively) (Schwarz 2012). Applied to goal-directed activity, the theory posits that positive moods signal that "good progress has been made and more effort may not be needed," whereas negative moods signal that "the status quo is troublesome" and "prompt people to focus on problems, determine what is wrong, and improve matters" (George 2011, pp. 156–157). Mood-as-input extends these ideas by suggesting that "the effects of any given mood depend upon the context within which the mood is experienced" (Martin and Stoner 1996, p. 279). That is, the motivational frame that an individual holds in a given situation shapes the implications of the individual's feelings for his or her behavior. As described in greater detail below, mood-as-input theory suggests that positive mood can promote search and negative mood can inhibit search under one motivational frame. But with a different motivational frame, these effects can reverse, with positive mood suppressing and negative mood stimulating search.

Researchers in the mood-as-input tradition (e.g., Hirt et al. 1996, Martin et al. 1993, Meeten and Davey 2011, Vaughn et al. 2006) have to date focused most specifically on two core motivational frames—task-focused (also called process focused) and performance-focused (also called outcome focused)—that guide individuals' judgments about how much effort to put into a particular course of action. A *task-focused* motivational frame reflects an emphasis on the process of engaging in a task and on the specific elements that comprise the task. Individuals adopt or exhibit such a frame when "doing something that is interesting and enjoyable in its own right, unconcerned about evaluation, or in a situation that conveys the impression that ability is malleable and can improve with interest and effort" (Vaughn et al. 2006, p. 601). In contrast, a *performance-focused* frame reflects an emphasis on the objectives or outcomes of a task and on attaining a specified or desired level of performance. People adopt or exhibit a performance-focused frame when "thinking about rewards or punishments (such as how our performance will make others feel about us), concerned about how we compare with others, aware that a certain level of performance is expected or required, or in a situation that conveys the impression that ability is fixed" (Vaughn et al. 2006, p. 601).

According to mood-as-input theory, the effects of mood depend on the extent to which a task- or performance-focused frame is salient because the frames correspond to different stop rules—heuristics for deciding when to cease or persist in a course of action (Martin and Stoner 1996). With a focus on the process of engaging in a task, and in the absence of salient performance standards, a task-focused frame leads people to persist in an activity as long as they find it enjoyable (Vaughn et al. 2006). A task-focused frame thus corresponds to an enjoyment rule, exemplified by a question such as "Do I feel like continuing?" (Hirt et al. 1997). Through a mood-as-information mechanism, the signal of positive mood to an enjoyment stop rule leads to persistence in, whereas the signal of negative mood leads to cessation of, an activity. In contrast, with a focus on the outcomes of a task, and with standards or evaluation salient, a performance-focused frame leads people to persist in an activity until they reach a desired level of performance (Vaughn et al. 2006). A performance-focused frame thus corresponds to a sufficiency rule, exemplified by a question such as "Have I done enough?" (e.g., Martin et al. 1993). The signal of positive mood to a sufficiency rule leads to relaxed effort, whereas negative mood leads to persistence.

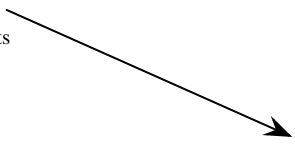
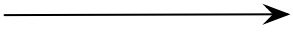
In sum, mood-as-input theory suggests that the effects of mood depend on the degree to which a task- or performance-focused motivational frame is salient at a

given point in time. An impressive and growing body of empirical research supports this basic tenet of mood-as-input theory, demonstrating that the effects of positive and negative mood are context dependent (e.g., George and Zhou 2002; Hirt et al. 1996, 1997; Martin et al. 1993, 1997; Sanna et al. 1996, Vaughn et al. 2006), leading Schwarz (2012, p. 297) to assert that "what people conclude from a given feeling depends on the epistemic question on which they bring it to bear." Although most mood-as-input research has examined individual-level behavior, the literature on group-level affect (Barsade and Gibson 2012) and evidence that the presence of in-group members can strengthen the effects of mood on evaluative judgments (Shteynberg et al. 2014) suggest that there may be homologous effects at higher levels. Mood-as-input theory may thus help make sense of how teams change in their focus on exploratory search over time. Below I integrate the mood-as-input model with theory and research on temporal milestones to develop predictions about how team mood influences patterns of exploratory search over time. Table 1 summarizes my theoretical arguments.

The Midpoint: A Key Temporal Milestone. A distinguishing characteristic of performing teams is their fixed deadline (Ishak and Ballard 2012). Research suggests that, rather than some absolute level of task progress, team members facing a deadline rely on temporal milestones—that is, key points in time relative to the project deadline—to pace their work (Gersick 1989, Hackman and Katz 2010, Seers and Woodruff 1997). Temporal milestones are opportunities for teams to break free of inertial patterns or routines and change how they approach their tasks (Gersick and Hackman 1990). Although teams can create milestones at any particular point in time (Gersick 1994), many teams use the midpoint of a project as a key milestone (Gersick 1989). In a classic theory-building study, Gersick (1988) observed that groups with varying time frames, from seven days to six months, all paused at their halfway points to take stock of progress and determine a path to take over the course of their remaining time. Grounding her punctuated equilibrium theory in these observations, Gersick (1988, p. 34) argued that the midpoint of a project acts as a natural "alarm clock, heightening team members' awareness that their time is limited, stimulating them to compare where they are with where they need to be and to adjust their progress accordingly. . . ." Several studies have since supported the idea that the midpoint is a transition point in teams facing a deadline. Research in the lab (e.g., Okhuysen and Waller 2002, Woolley 1998) and the field (e.g., Ericksen and Dyer 2004), using quantitative (e.g., Waller et al. 2002) and qualitative (e.g., Ericksen and Dyer 2004, Gersick 1989) methods, indicates that teams are likely to shift in their focus at the midpoint.

Building from Gersick's work, the literature on team pacing in the face of a deadline depicts two phases of task progress, separated by the midpoint, that are characterized by two different motivational frames. In the first phase of a team's life, when time is relatively abundant, members focus their efforts on learning about their tasks (Ericksen and Dyer 2004, Gersick 1988), gathering data (Ford and Sullivan 2004, Okhuysen and Waller 2002), and generating raw material and ideas regarding how to complete their tasks (Ford and Sullivan 2004, Waller et al. 2002). With their focus on these activities, team members often make little visible progress during the first half of a project (Gersick 1988, Seers and Woodruff 1997), which aligns with Gersick's assertion that it is a temporal milestone—not task progress—that triggers a shift in team activities. The focal activities of the first phase are thus aligned with a task-focused motivational frame—the frame that is salient when people engage in

Table 1 Team Mood and Exploratory Search Over Time in Teams Facing a Deadline

Concept	Early team life	Midpoint	Late team life
Prototypical team activities	Learning about the task, gathering information, generating raw material	Evaluating progress, assessing performance	Implementing ideas, preparing and refining project deliverables
Motivational frame	Task-focused	Increased salience of performance-focused	Performance-focused
Effect of team positive mood on team exploratory search	Promotes (H1)	Triggers shut down of exploratory search efforts (H3)	
Effect of team negative mood on team exploratory search	Suppresses (H2)	Sustains exploratory search efforts (H4)	
Value of team exploratory search for team performance	Beneficial when a team engages in high levels of exploratory search early in team life and declines in search from the midpoint to the deadline. (H5)		

activities such as "coming up with ideas for a new business venture" (Vaughn et al. 2006, pp. 609–610).

With a task-focused frame most salient, I propose that team positive mood likely promotes, whereas team negative mood likely inhibits, team exploratory search during the first phase of a team's life. Laboratory research grounded in mood-as-input theory consistently shows that when a task-focused frame is salient, individuals in a positive mood persist in a given course of action longer than those in a neutral or negative mood (e.g., Hirt et al. 1996, Martin and Stoner 1996). In contrast, individuals in a negative mood spend less time on a given course of action than those in a neutral or positive mood (e.g., Martin and Stoner 1996). Members of teams high in positive mood early in the team's life may interpret their positive feelings as a signal that they should continue to experiment with new alternatives to their tasks. In contrast, team negative mood may dissuade team members from engaging in exploratory search early in the team's life.

Hypothesis 1 (H1). *Team positive mood early in a team's life is positively related to team exploratory search early in a team's life.*

Hypothesis 2 (H2). *Team negative mood early in a team's life is negatively related to team exploratory search early in a team's life.*

Upon reaching the halfway point of the project, team members' approach to their work shifts, with their project goals becoming especially salient (Gersick 1989). Having used half of their time, team members' focus broadens (Gersick 1991), as they scrutinize their progress to determine whether they can adequately achieve their objectives by the deadline (Gersick 1989, Seers and Woodruff 1997). The midpoint thus prompts a decrease in members' task focus and an increase in attention to team objectives and performance. Team members' motivational frame at the midpoint thus becomes increasingly performance-focused—a frame activated when people engage in activities such as "selling a sufficient amount of goods and services to ensure a profit" (Vaughn et al. 2006, p. 610).

With a heightened focus on performance, I propose that team positive mood at the midpoint triggers a reduction in, whereas team negative mood sustains, exploratory search throughout the second phase of a team's life. Team positive mood likely leads team members, focused on evaluating their progress, to view the ideas they have generated to date as satisfactory (George and Zhou 2002, Martin and Stoner 1996, Martin et al. 1993) and therefore determine that additional search is unwarranted, especially given their approaching deadline. Consistent with this argument, laboratory research indicates that individuals in a positive mood exert less effort in generating ideas and perceive greater task progress than those in a negative or neutral mood when instructed to persist in a task until they feel they have done enough (e.g., Hirt et al. 1996, Martin and Stoner 1996). Team positive mood at the midpoint may act as a shutoff valve for team exploratory search at the temporal midpoint, leading team members to positively assess their progress and ramp down their efforts to find and test new ways of completing their tasks during the second phase of the team's life. Whereas individuals in a positive mood relax their efforts when a performance-focused frame is salient, research indicates that those in a negative mood exert greater effort in a given course of action and persist longer in generating ideas than those in a neutral mood (Martin and Stoner 1996). Through a mood-as-information mechanism, mood-as-input theory suggests that negative feelings prompt people with a performance-focused frame to evaluate progress critically, motivating a search for alternatives. Team negative mood may thus act as a buffer to the temporal pressure of the midpoint, leading members to conclude that additional experimentation is needed to improve the team's likelihood of meeting its objectives. I thus posit that team mood at the midpoint shapes how teams change over time in their focus on exploratory search from the midpoint through the second half of the team's life.

Hypothesis 3 (H3). *Team positive mood at the midpoint prompts a decline in team exploratory search over the course of the second half of a team's life.*

Hypothesis 4 (H4). *Team negative mood at the midpoint sustains team exploratory search over the course of the second half of a team's life.*

Patterns of Change in Team Exploratory Search Over Time and Team Performance

A prevalent theme in the largely theoretical and qualitative literature on team task pacing is that how teams pace their activities over time influences team performance. Anecdotally speaking, it is reasonable to expect that high levels of search early in the life of a team and decline in search during the second half of the team's life enhance performance. Consider again a team preparing for a product launch presentation. High exploratory search early in the team's life ensures that team members fully vet their task and identify promising avenues for their presentation. A decline in search at the midpoint ensures that members refrain from introducing new ideas when there is little time remaining to integrate those ideas into the presentation.

Consistent with these ideas, scholars (e.g., Ford and Sullivan 2004; Gersick 1988, 1989; Okhuysen and Waller 2002) suggest that effective teams pace their focus on innovation over time. Of most direct relevance, Ford and Sullivan (2004) drew from Gersick's (1988, 1989) work to propose a theoretical model of how the timing of novel contributions by team members affects

team effectiveness in the face of a deadline. Specifically, the authors argued that novel contributions are most likely to enhance team performance during the first half of a team's life because it is during the first phase that team members have adequate time to incorporate new ideas into their work. After the midpoint of a project, novel contributions distract team members from accomplishing their work and negatively influence team performance. These arguments suggest that the relationship between the trajectory of exploratory search and performance is such that high-performing teams engage in high amounts of search early in team life and decline in their focus on search during the second half of team life. Low-performing teams, on the other hand, may fail to search enough early in the life of the team or fail to ramp down search efforts as the deadline draws near. I thus propose an interaction, holding overall search constant, between early exploratory search and the extent to which teams decline in search after the midpoint, predicting team performance.

Hypothesis 5 (H5). *Team exploratory search early in a team's life interacts with decline in team exploratory search during the second half of the team's life to predict team performance. A decline in team exploratory search during the second half strengthens the relationship between early search and performance.*

Method

Administrators at a military academy located in the United States gave me access to study teams participating in an international, team-based competition. The annual competition is a one-day event in which teams navigate a nearly 10-kilometer course comprising obstacles and challenges, such as diagnosing and fixing faulty communications equipment, climbing a 10-foot wall, and destroying targets with grenades. Teams train for the competition for roughly four months and are composed of cadets who volunteer for and are selected to represent their academies and preparatory programs. On competition day, teams may have no more than nine members, including a team leader. Of these, there must be at least one person from each academy class and at least one female. Because injuries during training are common, teams almost always train with more than nine members during the preparation period.

Given that they prepare for a specific event, scheduled in advance, these teams are performing teams. And members of these teams must intentionally seek out and experiment with various approaches to their tasks in the hopes of improving their performance—that is, they must engage in exploratory search. For example, in response to an open-ended item asking for descriptive information, one member wrote, "One day, while experimenting, one of our team members figured out a new way to tie the knot for the one-rope bridge." Another member wrote, "We developed and rehearsed a new rotation for the wall."

Sample and Procedure

I collected longitudinal data from the 381 members of the 33 teams that represented the hosting academy. Administrators helped identify formal (i.e., listed on the roster) and informal (i.e., training as alternates) team members prior to the start of the training period. Including the leader and informal members, teams ranged in size from 10 to 17 members ($M = 11.54$, $SD = 1.33$). The sample was largely male (86%) and white (79%), and participants ranged in age from 17 to 24 years ($M = 20.31$, $SD = 1.40$).

Over the course of the study, which ran for roughly 16 weeks, participants completed four Web-based surveys, timed to align with theoretically meaningful periods in their team's life. The first survey (T0) coincided with team formation activity during the week prior to the start of the formal training period (94% response rate). The second survey (T1), administered approximately two weeks into the training period, focused on early team life (87%). The third survey (T2), administered at the halfway point of the training period, focused on the temporal midpoint (82%). The fourth survey (T3), administered one week before the competition, coincided with late team life (74%). The median team-level response rate, across teams and time, was 90%.[2] Finally, I collected the certified results of the military competition (T4).

Measures: Focal Constructs

Unless otherwise noted, participants responded to survey items using a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). For multi-item measures, interitem reliability values are along the diagonal in Table 2. The appendix provides items for unpublished survey measures.

Team Exploratory Search. To develop a measure of team exploratory search, I examined process-focused measures in the team learning construct space (Edmondson 1999, Gibson and Vermeulen 2003, Wong 2004) and selected items that tapped exploratory search. I modified these items to fit my research context and supplemented them with new items to focus specifically on exploratory search, rather than incremental forms of positive change in teams. Respondents completed the six-item measure at T1, T2, and T3, rating the extent to which each item characterized team activities during the prior week. I used the mean of members' individual ratings to operationalize team exploratory search.

Team Mood. I measured team mood at T1, T2, and T3 by sampling items from the opposing "octants" of the bipolar valence dimension of the affective circumplex (Larsen and Diener 1992). I sampled four items to

Table 2 Descriptive Statistics, Aggregation Indices, and Team-Level Correlations Among Study Variables

Variable	M	SD	ICC(1)	ICC(2)	$r_{wg(j)}$	1	2	3	4	5
1. *Team formation activity (T0)*	4.13	0.44	0.29**	0.80	0.91	(0.93)				
2. *Team experience (T0)*	7.58	2.54	—	—	—	−0.07	—			
3. *Team ability (T0)*	3.59	0.26	—	—	—	0.18	0.06	—		
4. *Team trait positive affectivity (T0)*	3.81	0.25	0.08**	0.46	0.95	0.53	0.13	0.26	(0.89)	
5. *Team trait negative affectivity (T0)*	1.93	0.18	0.00	0.03	0.94	−0.23	0.00	−0.03	−0.36	(0.82)
6. *Team positive mood (T1)*	3.86	0.28	0.09**	0.47	0.92	0.25	0.43	0.24	0.38	0.14
7. *Team positive mood (T2)*	3.86	0.35	0.08**	0.43	0.90	0.42	0.42	0.20	0.22	−0.31
8. *Team positive mood (T3)*	3.87	0.36	0.08**	0.41	0.90	0.34	0.21	0.25	0.22	−0.02
9. *Team negative mood (T1)*	1.58	0.19	0.03	0.20	0.94	−0.48	−0.32	−0.20	−0.43	0.25
10. *Team negative mood (T2)*	1.66	0.32	0.17**	0.65	0.94	−0.43	−0.30	−0.17	−0.19	0.54
11. *Team negative mood (T3)*	1.78	0.31	0.11**	0.50	0.91	−0.35	−0.24	−0.05	−0.15	0.35
12. *Team exploratory search (T1)*	3.09	0.44	0.19**	0.68	0.85	0.31	0.23	−0.13	0.22	−0.26
13. *Team exploratory search (T2)*	3.28	0.40	0.12**	0.54	0.83	0.12	0.10	−0.33	−0.14	0.14
14. *Team exploratory search (T3)*	3.12	0.50	0.16**	0.60	0.80	−0.06	−0.05	−0.32	−0.23	0.32
15. *Team performance (T4)*	6.15	0.67	—	—	—	0.25	0.45	0.22	0.56	−0.21

Table 2 (cont'd)

Variable	6	7	8	9	10	11	12	13	14	15
1. *Team formation activity (T0)*										
2. *Team experience (T0)*										
3. *Team ability (T0)*										
4. *Team trait positive affectivity (T0)*										
5. *Team trait negative affectivity (T0)*										
6. *Team positive mood (T1)*	(0.86)									
7. *Team positive mood (T2)*	0.48	(0.91)								
8. *Team positive mood (T3)*	0.44	0.55	(0.86)							
9. *Team negative mood (T1)*	−0.62	−0.58	−0.34	(0.82)						
10. *Team negative mood (T2)*	−0.20	−0.75	−0.22	0.62	(0.91)					
11. *Team negative mood (T3)*	−0.12	−0.45	−0.52	0.43	0.49	(0.87)				
12. *Team exploratory search (T1)*	0.32	0.29	0.35	−0.33	−0.23	−0.26	(0.92)			
13. *Team exploratory search (T2)*	0.23	0.06	0.27	0.08	0.10	0.03	0.66	(0.91)		
14. *Team exploratory search (T3)*	−0.06	−0.29	0.05	0.37	0.34	0.19	0.22	0.54	(0.94)	
15. *Team performance (T4)*	0.28	0.41	0.20	−0.28	−0.40	−0.06	0.22	−0.01	0.02	—

Notes. $N = 33$ teams. Internal consistency reliability coefficients are in parentheses along the diagonal for multi-item scales. For correlations greater than or equal to |0.29|, $p < 0.10$; for correlations greater than or equal to |0.34|, $p < 0.05$; for correlations greater than or equal to |0.44|, $p < 0.01$ (two-tailed). T0 = team formation, T1 = early team life, T2 = temporal midpoint, T3 = late team life, and T4 = performance deadline.

*$p < 0.05$; **$p < 0.01$ (two-tailed).

measure team positive mood and six items to measure team negative mood. Team members used a five-point Likert-type scale ranging from 1 (not at all) to 5 (a great amount) to rate how much each item characterized team interactions during the prior week. Consistent with prior research (e.g., Hirt et al. 2008), I combined the positively valenced items to index team positive mood and the negatively valenced items to index team negative mood. As above, I used the mean of members' individual ratings to operationalize team positive and team negative mood.

Team Performance. I used the results of the competition, collected at T4, to measure team performance. Teams received a point total for each obstacle in the competition and a score for how quickly they completed the overall course. I operationalized performance as the total number of points earned, the same metric used to determine the winner. Scores ranged from 485 to 785, so I rescaled performance (dividing by 100) to put scores on roughly the same scale as my survey measures.

Measures: Controls

Team Ability. Because of greater natural ability, some teams may be predisposed for high performance (Hackman 1987). I thus measured team ability at T0. The hosting academy routinely assesses cadet performance across three dimensions—athletic, military, and academic performance—that together feed into a cadet's class rank. I asked respondents to provide their overall class rank using a five-point scale ranging from the bottom 5% to the top 5%. I conceptualized team ability as an additive construct (Chan 1998a) and operationalized it as the team mean of members' individual rankings.

Team Experience. Because the competition is held annually and cadets can participate multiple times, some

teams may have more experience than others; experienced teams may need to search less than teams composed of competition novices (Argote 1999). At T0, I asked members to indicate the number of prior competitions for which they had trained. I conceptualized team experience as an additive construct (Chan 1998a) and operationalized it as the sum of prior events for which members had trained.

Team Formation Activity. Early team planning activities may influence how a team develops over time (Ericksen and Dyer 2004). Although guidelines restricted teams from training until the publication of "operational orders," and teams lacked access to equipment and sites prior to a formal launch date, prior participants suggested that teams sometimes begin preparing for the competition before the start date. I thus developed a five-item measure of team formation activity, which team members completed at T0.

Team Trait Affectivity. Theory and research indicate that group composition in team members' affective dispositions is significantly related to the shared mood that emerges among team members at any given point in time (George 1990, Kelly and Barsade 2001). To specifically examine the influence of mood on exploratory search, I controlled for team composition in trait affectivity, which I measured at T0. Participants completed the trait version of the Positive and Negative Affect Schedule (Watson et al. 1988), which instructs respondents to indicate how much they experience 20 items "in general." Participants used a five-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely) to respond to items such as "enthusiastic" for positive affectivity and "upset" for negative affectivity. I conceptualized team trait affectivity as an additive construct (e.g., van Knippenberg et al. 2010) and used the team mean of members' individual scores to measure, respectively, team trait positive and negative affectivity.

Levels of Analysis

The team is my focal unit of analysis. To determine the appropriateness of using the team mean to operationalize shared constructs, I followed the approach recommended by Klein et al. (2000), examining and interpreting a package of indices. As presented in Table 2, I examined two versions of the intraclass correlation (ICC) and the $r_{wg(j)}$ index of within-group agreement (James et al. 1984). Across constructs, there was strong support for within-group homogeneity in team member perceptions; median $r_{wg(j)}$ values were greater than or equal to 0.80. And for all but one shared construct (i.e., team negative mood at T1), ICC(1) values were significant, indicating nonindependence. Because within-group agreement was high (i.e., 0.94) for team negative mood, its low ICC(1) value reveals low between-group variance in team negative mood early in the life of the team. ICC(2) is a transformation of ICC(1) that accounts for group size (Bliese 2000); the information provided by ICC(2) largely mirrored that provided by ICC(1). Given, in particular, high within-group agreement, I used the team mean to operationalize all shared constructs.

Validity of Survey Measures

I used new or adapted sets of items to measure team exploratory search, team positive mood, team negative mood, and team formation activity. Table 3 presents the results of confirmatory factor analyses used to support the validity of the measures I used. For each construct, a one-factor model fit the data well at each point in time that I assessed the construct.

I conceptualized team positive and negative mood as opposite ends of the bipolar valence dimension of mood. To verify the discriminant validity of my measures, I compared the fit of a two-factor model (i.e., positive items as indicators of one factor, negative items as indicators of a second factor) with the fit of a simpler one-factor model (i.e., all items as indicators of one factor). The results in Table 3 support the discriminant validity of my measures. A one-factor model provided a poor fit, whereas a two-factor model fit the data well and significantly better than a one-factor model at T1 ($\Delta\chi^2_1 = 147.25$, $p < 0.01$), T2 ($\Delta\chi^2_1 = 232.65$, $p < 0.01$), and T3 ($\Delta\chi^2_1 = 288.68$, $p < 0.01$).

I measured team exploratory search, team positive mood, and team negative mood at multiple points in time. To ensure that my measures were consistent across time, I conducted measurement invariance analysis (Chan 1998b). That is, for each construct, I compared a model with factor loadings constrained to be equal across time (i.e., constrained model) with a more complex model with item loadings free to vary across time (i.e., unconstrained model). Measurement invariance is supported when the more parsimonious constrained model fits the data as well as the unconstrained model. As shown in Table 3, measurement invariance was supported for team exploratory search and team positive mood, but not for team negative mood. To understand the source of variation over time for my measure of team negative mood, I examined the loadings across time in the unconstrained model and discovered that, relative to the other items' loadings, the item "Lethargic" exhibited high volatility over time. I thus fit a revised measurement model to the data excluding this item. The fit of the revised model was substantially better, and measurement invariance was supported. I thus used the revised measure in all analyses.

Results

Table 2 presents intercorrelations among study variables. In general, the pattern and direction of correlations was in line with my expectations. First, the relationship between team mood and exploratory search

Table 3 Results of Survey Measure Validation Analyses

	χ^2	df	CFI	RMSEA	SRMR	$\Delta\chi^2$
Team formation activity						
T0	25.14	5	0.96	0.11	0.03	
Team exploratory search						
T1	62.97	9	0.93	0.14	0.04	
T2	54.97	9	0.94	0.13	0.04	
T3	108.35	9	0.88	0.20	0.06	
Invariance: Unconstrained model	325.94	114	0.92	0.08	0.05	17.62
Invariance: Constrained model	343.56	124	0.91	0.07	0.06	
Team positive mood						
T1	0.97	2	1.00	0.00	0.01	
T2	0.98	2	0.98	0.13	0.02	
T3	0.99	2	1.00	0.00	0.02	
Invariance: Unconstrained model	66.84	39	0.98	0.05	0.04	4.35
Invariance: Constrained model	71.19	45	0.98	0.04	0.05	
Team negative mood						
T1	72.02	9	0.91	0.15	0.05	
T2	48.10	9	0.94	0.12	0.04	
T3	37.76	9	0.96	0.11	0.03	
Invariance: Unconstrained model	284.77	114	0.93	0.07	0.05	26.88*
Invariance: Constrained model	311.65	124	0.92	0.07	0.06	
Team negative mood—revised						
T1	7.19	5	1.00	0.04	0.02	
T2	14.84	5	0.98	0.08	0.03	
T3	4.11	5	1.00	0.00	0.01	
Invariance: Unconstrained model	124.68	72	0.97	0.05	0.04	12.25
Invariance: Constrained model	136.93	80	0.97	0.05	0.05	
Team mood: one factor						
T1	272.97	35	0.78	0.15	0.08	
T2	354.84	35	0.75	0.18	0.09	
T3	371.36	35	0.75	0.19	0.10	
Team mood: two factors						
T1	125.72	34	0.92	0.09	0.05	147.25**
T2	122.19	34	0.93	0.10	0.05	232.65**
T3	82.68	34	0.96	0.07	0.05	288.68**

Notes. "Unconstrained model" refers to a model with factor loadings free to vary across T1–T3. "Constrained model" refers to a model in which factor loadings are constrained to be equal across T1–T3. CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.
*$p < 0.05$; **$p < 0.01$ (two-tailed).

changed over time, with positive mood exhibiting a more positive relationship with search early in a team's life ($r = 0.32$, $p = 0.07$) compared with either the temporal midpoint ($r = 0.06$, $p = 0.75$) or late team life ($r = 0.05$, $p = 0.80$) and team negative mood exhibiting a more negative relationship with search early in a team's life ($r = -0.34$, $p = 0.05$) compared with either the midpoint ($r = 0.10$, $p = 0.64$) or late team life ($r = 0.19$, $p = 0.30$). Second, early team positive mood was positively ($r = 0.28$, $p = 0.11$) and early team negative mood was negatively ($r = -0.28$, $p = 0.11$) related to team performance. And similarly, team positive mood at the temporal midpoint was positively ($r = 0.41$, $p = 0.02$) and team negative mood at the midpoint was negatively ($r = -0.40$, $p = 0.03$) related to performance. Although these results are consistent with my predictions, bivariate correlations do not test how team mood shapes *change* in exploratory search over time. Below I report the results of growth models that precisely test my predictions about change over time. First, however, I verify an important assumption that underpins my predictions.

Do Motivational Frames Change Over Time?

I argued above that the temporal midpoint prompts a shift in how team members approach their work, with members' task focus decreasing, and performance focus increasing, from early team life to the temporal midpoint. To test this assumption that team members' motivational frames changed over time, I examined the language that team members used in responses to open-ended questions at the conclusion of the T1, T2, and T3 surveys. On each survey, team members could provide comments about what was going well in their team and what was not. Although the open-ended items were optional, many team members provided responses. Specifically, 59%, 52%, and 42% of respondents entered substantive open-ended comments at T1, T2, and T3, respectively. My objective in analyzing these comments was to assess how respondents'

use of task- and performance-focused language changed over time, especially between early team life and the temporal midpoint. Thus, I created two sets of words—one task-focused and the second performance-focused—and, using text analysis, calculated the rate at which respondents used these words (relative to the overall word count) at each point in time. The task-focused set included words such as *task*, *process*, *train*, *practice*, and the names of individual obstacles in the competition (e.g., *wall*, *grenade*). The performance-focused set included words such as *performance*, *competition*, *win*, and permutations of the phrase *day of event*.[3] I expected members' use of task-focused words to decrease, and performance-focused words to increase, from early team life to the midpoint.

Use of task-focused words indeed dropped from early team life (29.70%) to the midpoint (15.74%), with members using task-focused words at T2 at roughly half the rate used at T1 ($\chi^2_1 = 53.46,\ p < 0.01$). Use of performance-focused words increased from early team life (5.03%) to the midpoint (10.28%), with members using such words at nearly twice the rate at T2 compared with T1 ($\chi^2_1 = 18.94,\ p < 0.01$). Word usage did not change significantly from the midpoint to late team life (task: $\chi^2_1 = 3.02$, n.s.; performance: $\chi^2_1 = 0.10$, n.s.). These results are consistent with the idea that teams shift in their motivational frames at the midpoint, becoming relatively more performance-focused and less task-focused.

Change in Team Exploratory Search Over Time

My hypotheses focus on understanding drivers of change in team exploratory search over time. To test these hypotheses, I used growth modeling, "one of the dominant ways of modeling change in the social sciences" (Ployhart and Vandenberg 2009, p. 111). In contrast to analytical approaches grounded in the general linear model (e.g., repeated measures analysis of variance), which are most useful for examining differences in mean change in a construct for bounded groups of observations (e.g., women versus men), growth modeling is a technique specifically designed to estimate (a) the average pattern of change in a construct over time, (b) the extent to which observations (in my case, teams) vary in their patterns of change in that construct, and (c) the significance of drivers of different patterns of change (Bliese and Ployhart 2002, Singer and Willett 2003). Because my theorizing targets team mood as a potential driver of change in team exploratory search, growth modeling affords the best test of my hypotheses.

In growth modeling, patterns of change over time are represented through the combination of two parameters (for more details, see Singer and Willett 2003). The *change intercept* is the anchor of the trajectory and represents the level of the focal construct (in my case, team exploratory search) at a specific point in time. The *change slope* is the rate of change in the focal construct over time, that is, how much the construct changes in a unit of time. Through the use of random coefficient models, each of these parameters can vary, enabling a researcher to test how predictor variables relate to the level of the focal construct at a given point in time (i.e., the change intercept) or to the rate of change in the focal construct over time (i.e., the change slope). In my growth model analyses, I used bootstrapping to calculate standard errors. Bootstrapping is a useful procedure for small sample sizes because the typical estimation procedures used in random coefficient modeling rely on asymptotic assumptions (Chernick 2011). To assess support for my hypotheses, I examined the 95% confidence interval of the 10,000 bootstrap estimates that I drew (denoted as CI) and rejected a hypothesis if the interval included zero.

Much like centering variables in multilevel models to improve the interpretability of coefficients (Hofmann and Gavin 1998), centering the variable representing time in a growth model can focus parameter estimates on specific points in the change trajectory (Biesanz et al. 2004). To test Hypotheses 1 and 2 regarding the relationship between early team mood and initial team exploratory search, I coded time such that the change intercept represents team exploratory search early in the team's life (i.e., T1 = 0, T2 = 1, T3 = 2). To test Hypotheses 3 and 4 regarding the relationship between team mood at the midpoint and change in team exploratory search from the midpoint through late team life, however, I coded time such that the change intercept represents team exploratory search late in the team's life (i.e., T1 = −2, T2 = −1, T3 = 0). In all analyses, I grand mean-centered predictor variables.

Base Growth Model for Team Exploratory Search. Before testing the effect of team mood on the trajectory of team exploratory search over time, I first used Bliese and Ployhart's (2002) model-building approach to determine the base growth curve that best fit team exploratory search. With this approach, I started by graphing my data, then steadily increased the complexity of models fit to the data to identify whether (a) the basic pattern of change over time was consistent with my expectations, (b) teams varied in team exploratory search early in team life, and (c) teams varied in their slope of change in exploratory search over time. I found that a base growth model containing a linear effect of time (B = 0.37), a quadratic effect of time (B = −0.18), a random intercept term, a random slope term, and a covariance term for the relationship between the random intercept and random slope best fit the data. The correlation between the intercept and slope ($r = -0.57$) indicated that teams that engaged in high levels of exploratory search early in life tended to decline in their focus on search over time. Growth models control for this relationship, enabling me

to test the effect of team mood on change in search above and beyond initial levels of search. These results thus show that, on average, teams increased in search from early team life to the midpoint, but then decreased from the midpoint to the performance deadline. However, teams varied significantly in their starting levels of search and in how they changed in search over time.

Early Team Mood and Initial Team Exploratory Search. Table 4 presents the results of growth models used to test my predictions regarding the relationship between team mood and initial exploratory search. In these models, time is coded such that the intercept represents exploratory search early in a team's life. Accordingly, the fixed effects reflect the relationship between predictors and early search.

I proposed in Hypothesis 1 that early team positive mood is positively related to early team exploratory search. In Hypothesis 2, I proposed that early team negative mood is negatively related to early team exploratory search. As can be seen in Model 3 of Table 4, the direction of the estimate for team positive mood aligned with my prediction of a positive relationship ($B = 0.34$); further, 90% of bootstrap estimates were positive. However, the confidence interval included zero ($CI = -0.08, 0.79$). Thus, although the results showed a strong trend in line with my expectations, Hypothesis 1 was not supported. Model 5 of Table 4 shows that the estimate of the relationship between team negative mood and early exploratory search was, counter to my predictions, positive ($B = 0.48$). Furthermore, only 16% of bootstrap estimates were negative ($CI = -0.24, 1.25$). So Hypothesis 2 was also not supported.

Change in Team Exploratory Search from the Midpoint to Late Team Life. Table 5 presents the results of growth models used to test my predictions regarding the relationship between team mood at the midpoint and change in team exploratory search over time. For these analyses, I coded time such that the intercept represents exploratory search in late team life. I did this to focus on the relationship between team mood at the midpoint and team exploratory search levels close to the deadline. Main effects in Table 5 thus represent the relationship between predictors and search late in a team's life; interactions with time represent the effect of a predictor on the slope of change in team exploratory search over time.

I proposed in Hypothesis 3 that team positive mood at the midpoint triggers a decline in team exploratory search over the second half of a team's life. The coefficient for the interaction between team positive mood at the midpoint and time in Model 3 of Table 5 indicates that the relationship between team positive mood at the midpoint and change in exploratory search over time was indeed negative ($B = -0.35$). The confidence interval did not include zero ($CI = -0.59, -0.14$), and more than 99% of bootstrap estimates were negative, in support of Hypothesis 3. To gauge the practical importance of team positive mood at the midpoint, I examined the reduction in the random slope parameter (i.e., time random effect) due specifically to team positive mood. Team positive mood at the midpoint accounted for 22% of the variance in the slope of change in team exploratory search over time, above and beyond the controls.

I theorized, specifically, that team positive mood at the midpoint is associated with a decreasing rate of exploratory search, beginning at the midpoint and extending into late team life. To verify that the results

Table 4 Results of Growth Models Used to Test Predictions About Early Team Exploratory Search

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Fixed effects							
Intercept	3.09 (0.06)	3.09 (0.06)	3.08 (0.06)	3.09 (0.06)	3.09 (0.07)	3.09 (0.07)	3.09 (0.07)
Time	0.37 (0.09)	0.37 (0.09)	0.37 (0.09)	0.37 (0.09)	0.37 (0.09)	0.37 (0.09)	0.37 (0.09)
Time^2	−0.18 (0.05)	−0.18 (0.05)	−0.18 (0.05)	−0.18 (0.05)	−0.18 (0.04)	−0.18 (0.05)	−0.18 (0.05)
Team formation activity		0.30 (0.15)	0.26 (0.16)	0.25 (0.15)	0.33 (0.16)	0.30 (0.16)	0.38 (0.17)
Team experience		0.02 (0.03)	0.01 (0.03)	0.02 (0.03)	0.03 (0.03)	0.02 (0.03)	0.01 (0.03)
Team ability		−0.47 (0.21)	−0.51 (0.22)	−0.51 (0.22)	−0.51 (0.24)	−0.49 (0.23)	−0.54 (0.24)
Team trait positive affectivity		−0.21 (0.27)	−0.29 (0.27)			−0.19 (0.30)	−0.35 (0.31)
Team trait negative affectivity				0.22 (0.39)	0.22 (0.42)	0.16 (0.45)	−0.18 (0.50)
Early team positive mood			0.34 (0.27)				0.64 (0.31)
Early team negative mood					0.48 (0.47)		0.89 (0.52)
Random effects							
Intercept	0.43 (0.04)	0.41 (0.05)	0.40 (0.05)	0.42 (0.06)	0.44 (0.07)	0.42 (0.06)	0.43 (0.08)
Time	0.27 (0.05)	0.27 (0.05)	0.28 (0.05)	0.27 (0.05)	0.27 (0.05)	0.27 (0.05)	0.27 (0.05)
Intercept–Time correlation	−0.57 (0.13)	−0.56 (0.18)	−0.56 (0.17)	−0.57 (0.19)	−0.62 (0.20)	−0.57 (0.19)	−0.63 (0.20)
Residual	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)
Log likelihood	−16.46	−17.00	−16.60	−16.69	−16.00	−16.56	−14.02
Akaike information criterion	46.93	55.99	57.21	55.37	56.00	57.12	56.03

Notes. $N = 99$ observations nested in 33 teams. Time is coded such that the intercept represents team exploratory search early in team life (i.e., T1 = 0, T2 = 1, and T3 = 2). Bootstrap standard errors are in parentheses.

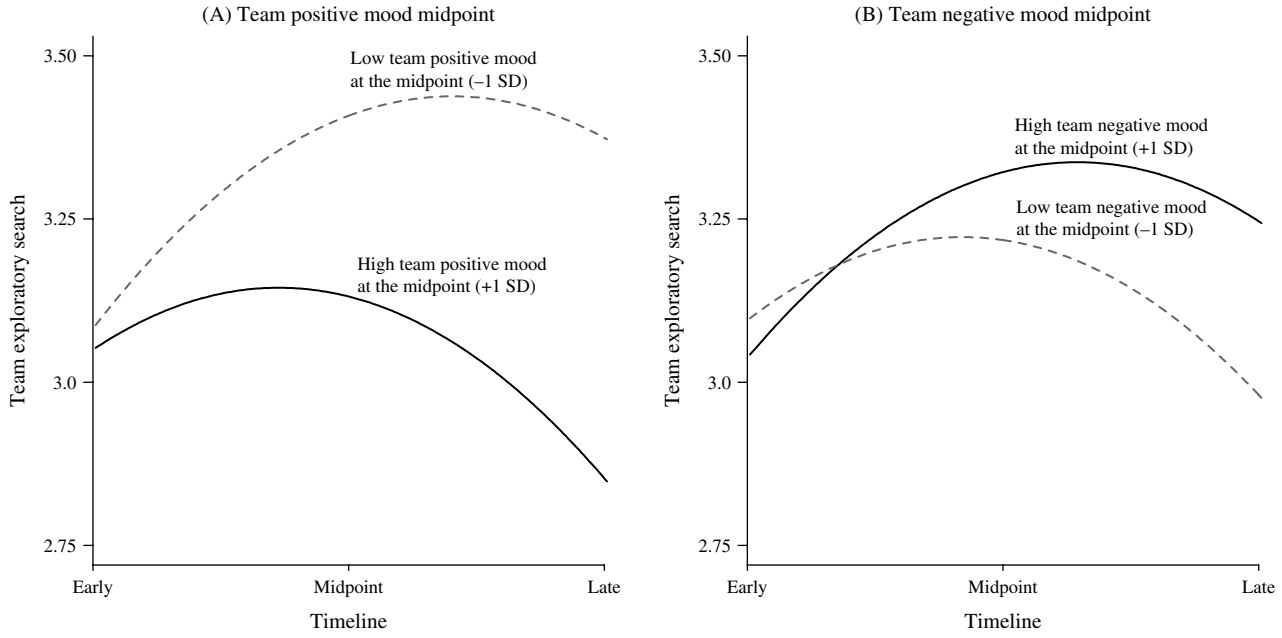
Table 5 Results of Growth Models Used to Test Predictions About Change in Team Exploratory Search Over Time

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects						
Intercept	3.12 (0.07)	3.11 (0.07)	3.11 (0.07)	3.11 (0.07)	3.11 (0.08)	3.11 (0.09)
Time	−0.34 (0.10)	−0.34 (0.10)	−0.34 (0.10)	−0.34 (0.11)	−0.34 (0.11)	−0.34 (0.11)
Time^2	−0.18 (0.04)	−0.18 (0.04)	−0.18 (0.04)	−0.18 (0.05)	−0.18 (0.05)	−0.18 (0.05)
Team formation activity		0.30 (0.15)	0.33 (0.22)	0.25 (0.15)	0.37 (0.21)	0.43 (0.27)
Team experience		0.02 (0.03)	0.02 (0.04)	0.02 (0.03)	0.03 (0.04)	0.03 (0.05)
Team ability		−0.47 (0.21)	−0.58 (0.23)	−0.51 (0.23)	−0.52 (0.28)	−0.69 (0.33)
Team trait positive affectivity		−0.21 (0.26)	−0.71 (0.34)			−0.63 (0.46)
Team trait negative affectivity				0.22 (0.40)	0.59 (0.47)	0.09 (0.66)
Early team positive mood			0.31 (0.31)			0.72 (0.60)
Midpoint team positive mood			−0.76 (0.26)			− 0.84 (0.48)
Late team positive mood			0.36 (0.23)			0.54 (0.38)
Early team negative mood					0.38 (0.59)	0.98 (0.89)
Midpoint team negative mood					0.41 (0.35)	−0.27 (0.55)
Late team negative mood					0.03 (0.28)	0.23 (0.47)
Time × *Team trait positive affectivity*			−0.31 (0.12)			−0.20 (0.14)
Time × *Team trait negative affectivity*					0.53 (0.23)	0.47 (0.29)
Time × *Midpoint team positive mood*			−0.35 (0.14)			−0.29 (0.28)
Time × *Midpoint team negative mood*					0.25 (0.14)	0.01 (0.31)
Random effects						
Intercept	0.46 (0.04)	0.45 (0.05)	0.39 (0.05)	0.44 (0.06)	0.41 (0.08)	0.35 (0.09)
Time	0.27 (0.05)	0.27 (0.05)	0.23 (0.04)	0.27 (0.05)	0.23 (0.06)	0.22 (0.05)
Intercept–Time correlation	0.65 (0.09)	0.68 (0.08)	0.60 (0.14)	0.67 (0.10)	0.54 (0.19)	0.50 (0.27)
Residual	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)
Log likelihood	−16.36	−17.31	−12.96	−17.04	−12.32	−7.81
Akaike information criterion	46.72	56.63	57.93	56.08	56.63	59.63

Notes. $N = 99$ observations nested in 33 teams. Time is coded such that the intercept represents team exploratory search late in team life (i.e., T1 = −2, T2 = −1, and T3 = 0). Bootstrap standard errors are in parentheses.

in Model 3 of Table 5 fit this pattern, I graphed predicted exploratory search trajectories for teams relatively low (i.e., −1 SD) and relatively high (i.e., +1 SD) in team positive mood at the midpoint and conducted simple slopes analysis on the rate of change in search at different points in time. As Figure 1, panel (A) shows, the pattern was as predicted, with teams high in positive mood at the midpoint beginning to decline at the temporal midpoint ($B = -0.22$, $p < 0.05$) and declining rapidly throughout late team life ($B = -0.47$,

Figure 1 Team Mood at the Midpoint and Change in Team Exploratory Search Over Time



$p < 0.001$). Teams low in team positive mood at the midpoint, on the other hand, were increasing in exploratory search at the midpoint (B = 0.14, $p < 0.05$), only beginning to decrease during late team life (B = −0.22, $p < 0.05$) and at a rate roughly half that of the teams high in team positive mood at the midpoint. Figure 1, panel (A) also shows that teams high in team positive mood at the midpoint were engaged in far less search late in team life than teams low in team positive mood at the midpoint. Indeed, the main effect of positive mood at the midpoint on exploratory search late in the life of a team was negative (B = −0.76, CI = −1.16, −0.35), and 99% of bootstrap estimates were negative. Team positive mood at the midpoint explained 17% of the variance in exploratory search late in the life of a team. Hypothesis 3 was supported.

I proposed in Hypothesis 4 that team negative mood at the midpoint sustains exploratory search from the midpoint through late team life. As seen in Model 5 of Table 5, the relationship between team negative mood at the midpoint and change in team exploratory search over time was, consistent with Hypothesis 4, positive (B = 0.25, CI = 0.01, 0.47), and 95% of bootstrap estimates were positive. Team negative mood at the midpoint explained 6% of the variance in the slope of change in exploratory search. As above, I graphed predicted search trajectories for teams relatively low (i.e., −1 SD) and high (i.e., +1 SD) in team negative mood at the midpoint and used simple slopes analysis to examine the pattern of results. As Figure 1, panel (B) shows, the pattern was as expected. Teams high in negative mood at the midpoint were changing at an increasing rate in exploratory search at the midpoint (B = 0.10, $p < 0.10$), only beginning to decline in exploratory search in late team life (B = −0.26, $p < 0.05$). Teams low in team negative mood at the midpoint, on the other hand, were beginning to decline in exploratory search at the midpoint (B = −0.07, n.s.) and declining in late team life at a rate nearly twice that of teams high in team negative mood at the midpoint (B = −0.43, $p < 0.001$). Together, these slope differences led teams high in negative mood at the temporal midpoint to exhibit relatively greater search in late team life (B = 0.41, CI = −0.07, 1.04). In all, 93% of bootstrap estimates for the relationship between team negative mood at the midpoint and exploratory search late in a team's life were positive. Hypothesis 4 was supported.

Change in Team Exploratory Search Over Time and Team Performance

In Hypothesis 5, I predicted that early team exploratory search and decline in search over the second half of a team's life interact to shape team performance. Testing this hypothesis required a measure of each team's rate of change in exploratory search. In the random coefficient approach to growth modeling, allowing the relationship between time and the dependent variable to vary across teams provides a measure—the Bayes estimator—of each team's rate of change in the focal construct (see, e.g., Chen 2005). I thus extracted the Bayes estimators from an unconditional growth model of exploratory search, with time coded such that the intercept represented search late in a team's life. With this coding of time, and the quadratic term for time in the model, the Bayes estimators provide a measure of each team's instantaneous rate of change in the second half of a team's life. I used the Bayes estimators in ordinary least squares (OLS) regression models to predict team performance, above and beyond control variables, and test Hypothesis 5.

Table 6 presents the results of these analyses. Because of high multicollinearity among measures of mood over time, I included only team positive mood early in team life and at the midpoint in the models. As Model 2 of Table 6 shows, team positive mood at the midpoint was positively related to team performance (B = 0.84, $p < 0.05$). The interaction between early search and decline in search from the midpoint (Model 4 of Table 6) was significant (B = −1.49, $p < 0.05$), explaining 5% of the variance in team performance, above and beyond the controls. I used the process outlined by Preacher et al. (2006) to understand the nature of the interaction. That is, I (a) plotted the relationship between initial search and performance at relatively high and low values of decline in search from the midpoint (Figure 2, panel (A)) and (b) plotted the simple slope of the relationship at the full range of values of decline in search (Figure 2, panel (B)). The inset boxes in Figure 2, panel (A) represent four patterns of exploratory

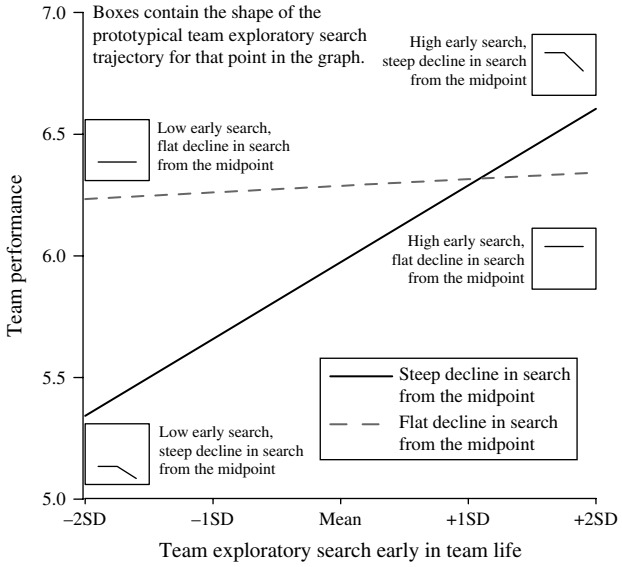
Table 6 Results of OLS Regression Models Predicting Team Performance

Variable	Model 1	Model 2	Model 3	Model 4
Intercept	6.15	6.15	6.15	6.07
Team formation activity	0.00	−0.17	−0.29	−0.50
Team experience	0.10*	0.09+	0.08+	0.08+
Team ability	0.18	0.15	0.37	0.38
Team trait positive affectivity	1.24*	1.64*	1.82*	1.92*
Team trait negative affectivity	−0.15	0.46	0.25	0.38
Team positive mood early in team life		−0.62	−0.71	−0.50
Team positive mood at the midpoint		0.84*	0.77+	0.71+
Early team exploratory search			0.40	0.39
Decline in team exploratory search at the midpoint			1.13+	0.72
Early team exploratory search× Decline in team exploratory search at the midpoint				−1.49*
F	4.60**	3.80**	3.65**	3.94**
Degrees of freedom	5,27	7,25	9,23	10,22
Adjusted R^2	0.46	0.52	0.59	0.64

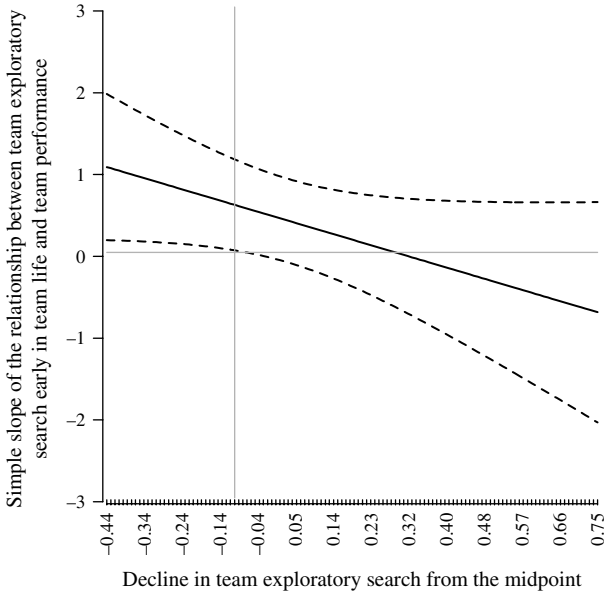
Note. $N = 33$ teams.
+$p < 0.10$; *$p < 0.05$; **$p < 0.01$ (two-tailed).

Figure 2 Probing the Interaction of Early Team Exploratory Search and Decline in Exploratory Search Predicting Team Performance

(A) Relationship at +1/–1 SD of decline in team exploratory search from the midpoint



(B) Confidence bands around the simple slope of team exploratory search early in team life



search over time, crossing initial search and change in search over time. As seen in Figure 2, panel (A), the relationship between these patterns and team performance was as expected. For teams that declined the most in exploratory search, the relationship between early search and performance was strongly positive ($B = 0.71$, $p < 0.05$). For teams that declined the least in search after the midpoint, the relationship between early search and performance was flat ($B = 0.06$, n.s.). The predicted performance scores suggested that for a team to score in the top 25% in the military competition, members had to engage in high levels of early search *and* exhibit a steep decline in search during the second half of their team's life. High early search without a decline in search yielded average performance, as did low early search without a decline in search late in the team's life. The one trajectory associated with very low performance, as depicted in the lower left quadrant of panel (A), was low exploratory search early in the team's life, followed by a steep decline in exploratory search late in the team's life. The results thus support Hypothesis 5.

Discussion

It has been two and a half decades since Gersick (1988) proposed that temporal milestones provide teams with opportunities to change. Since then, scant research has explored why some teams use such opportunities more effectively than others do, shifting in their activities adaptively as a deadline approaches. In this paper, I have argued that affect is at the heart of understanding how and why teams change in idiosyncratic ways over time.

Integrating the mood-as-input model with research on temporal milestones in teams, I proposed that mood shapes how teams change in exploratory search over time and that these search trajectories influence team performance in the face of a deadline. I found that, on average, teams changed in their focus on exploratory search in a curvilinear pattern over time, with maximum search at the midpoint. In contrast to prior research on midpoint effects—the majority of which is either qualitative or laboratory based—my study was field based, quantitative, and followed teams over a total of four months. That my findings affirm prior research on midpoint effects, despite these methodological differences, triangulates on the importance of temporal milestones in teams facing a deadline. And yet teams changed in different ways over time. Some teams declined in exploratory search more sharply after the midpoint than others; some teams persisted in their search efforts even as the deadline drew near.

I introduced affect—and specifically, team mood—as one explanation for why teams differ in how they navigate temporal milestones. Grounding my theorizing in the mood-as-input model, I proposed that team mood shapes a team's trajectory of exploratory search over time. Early in a team's life, when a task-focused motivational frame is salient, I posited that positive mood promotes, whereas negative mood suppresses, exploratory search. Although my findings regarding the effects of mood early in team life were not significant, there was

a strong trend in line with my predictions for positive mood. It is possible that the timing of my first measure of mood was at the edges of the hypothesized relationship, which would decrease power and contribute to missing an effect that truly exists (Mitchell and James 2001). My nonsignificant findings for negative mood may have resulted from low between-team variance. Teams in my study varied little in early team negative mood, and further, few members *across teams* reported experiencing negative mood at this point in team life. A larger, more diverse sample of teams might have yielded stronger effects of early team mood on early search.

I suggested that team members' approach to their work changes at the temporal midpoint, with members becoming increasingly more performance-focused than they were in early team life. My text analyses corroborated this notion. Some research suggests that teams are largely path dependent in their task approaches over time (e.g., Woolley 2009), but my findings align with Gersick and Hackman's (1990) conceptualization of temporal milestones as opportunities for teams to break their inertial patterns. I drew from mood-as-input theory to propose that team mood at the midpoint is one mechanism that determines whether team members leverage the opportunity to change at the midpoint. I found that positive mood at the midpoint served as a shutoff switch for exploratory search, yielding a sharp decline in search over the second phase of the team's life. Team negative mood, in contrast, acted as a buffer to the temporal pressure of the midpoint, contributing to sustained search efforts during the second half of the team's life. Mood at the midpoint may thus be a catalyst of change in teams that face a deadline.

How teams change over time, I argued and found, influences team performance. The highest-performing teams in my study were those that engaged in high levels of exploratory search early in the life of the team and declined in exploratory search at the midpoint. Indeed, my findings showed that only those teams that searched extensively early in the team's life and declined in search during the second half scored in the top quartile of teams in the competition. My results thus underscore the value of examining trajectories of change in teams over time for understanding team performance.

The findings of my study, however, must be interpreted in light of its limitations. First, I studied a unique sample of teams; research is needed to verify the generalizability of my findings to teams in more traditional organizational contexts. Second, although comparable to other studies of change in teams over time (e.g., Mathieu and Rapp 2009, Mathieu and Schulze 2006), my team-level sample size was small, which inhibited me from conducting an integrated test of the effects of team mood on performance *through* the trajectory of team exploratory search. A simulation-based power analysis (Gelman and Hill 2007) indicated that my sample size provided power of 0.45 to detect a medium effect size in growth analyses. It is possible that reduced power, rather than the absence of effects, accounts for nonsignificant findings in my study. Third, although I used prior theory and research to guide the timing of measurement periods, it is possible that my conclusions would differ had I gathered data at different or additional points in time (Mitchell and James 2001). Future research, using more continuous and less obtrusive measures of search and mood, would be useful for depicting trajectories at a more granular level than was possible in my study. Finally, my research design does not permit causal conclusions. Although my results are consistent with my predictions, I cannot firmly conclude that the mood at the midpoint causes a shift in exploratory search or that patterns of search over time cause team performance. Experimental studies would allow for more definitive causal conclusions.

Notwithstanding these limitations, I make three main theoretical contributions. First, my findings suggest that mood is a motor of change in teams that face a deadline. Theorists (e.g., Gersick 1991, Staudenmayer et al. 2002) have speculated that times of transition are often infused with affect. Yet, to date, scant research has explored how affect influences change over time in teams that face a deadline. My findings indicate that, when teams pause at a milestone to evaluate their progress, mood provides information that influences the extent to which members close down or sustain efforts to find alternative approaches to their work. Mood may thus be a trigger for change in teams that face a deadline, especially during salient temporal milestones such as the midpoint. This has important practical implications, given that research has highlighted group mood as something that leaders and managers can influence to shape group processes and outcomes (e.g., Sy et al. 2005, Van Kleef et al. 2009).

Second, my findings underscore that time is an important contextual factor to consider when making sense of the effects of mood in teams that face a deadline. Mood-as-input theory suggests that contextual factors shape the effects of mood on motivation. My research extends this idea by suggesting that a team's temporal context may shape the motivational frames that members employ in thinking about their work and, thus, how mood influences team dynamics. Although I did not find support for my prediction that mood influences exploratory search early in team life, the pattern of correlations that I observed between team mood and exploratory search over time is consistent with the idea that temporal context shapes the nature of mood effects. Accounting for contextual effects, such as a team's position in time, may help reconcile contradictory findings about how mood influences decision making or creativity in teams (Barsade and Knight 2013). Some research

(e.g., Grawitch et al. 2003) finds that positive mood promotes creativity, whereas other research (e.g., Jones and Kelly 2009) finds negative mood is beneficial. Theorists (e.g., George 2011) have argued that, depending on the context, both positive and negative mood can be functional. I introduce temporal context as one factor to consider when studying affect in teams facing a deadline.

Third, my research emphasizes that a team's focus on exploratory search is dynamic and something that team members modulate over time. Scholars (Cronin and Weingart 2011, Marks et al. 2001, McGrath 1986) have lamented the dearth of research on how teams change over time. Innovation scholars, in particular, have noted, "Existing innovation research can be fundamentally criticized for its largely inaccurate portrayal of innovation in organizations as being static, snapshot, linear processes" (Anderson et al. 2004, p. 160). Exploratory search, I find, is far from static. The teams I studied changed in their focus on search over time. And these patterns of search over time influenced performance, underscoring the value of conceptualizing team processes and emergent states as dynamic phenomena.

My study of military teams enabled me to examine changes in exploratory search over a 16-week time horizon and five time points of data. Yet this research setting restricted the depth and precision with which I could examine microlevel dynamics in teams over time. Future research, especially targeting three theoretical puzzles, would help further map the nomological network of shared affect in teams and disentangle nuanced theoretical accounts of the effects of mood on team processes and outcomes. First, theory and research rooted in the behavioral theory of the firm (March and Simon 1958), as well as Gersick's (1988, 1989) theorizing regarding change in teams at the midpoint, suggest that a focus on exploratory search is motivated by a performance gap. My research extends these ideas by specifying that team mood may be an important input to members' evaluation of their task progress at the midpoint. At the heart of my conceptualization, and core to the mood-as-input theory, is the mood-as-information mechanism, which presumes that individuals use how they feel as a subtle indicator in evaluating their performance. But is team mood an accurate reflection of team effectiveness at the midpoint? To explore these questions, I examined in post hoc analyses the relationships among team members' *perceptions* of their team performance over time, their shared positive and negative moods, and objective performance in the military competition. Consistent with the mood-as-information perspective and the notion that teams evaluate their progress at the midpoint, team positive mood ($r = 0.74$, $p < 0.01$) and team negative mood ($r = -0.75$, $p < 0.01$) were especially tightly linked to perceptions of performance at the midpoint. Furthermore, members' shared perceptions of performance were linked to later performance in the actual competition ($r = 0.39$, $p < 0.05$). Consistent with prior theory and research (e.g., Carver and Scheier 1990, George and Brief 1996, Simon 1967), these results indicate that mood is an indicator of performance gaps. My research cannot, however, tease apart whether performance evaluations precede mood or whether mood precedes evaluations of performance—a puzzle that has plagued affect scholars for decades (Zajonc 1980). Future research is needed to investigate the causal order of team mood, objective performance, and perceptions of team performance. It is likely that relationships among these constructs are dynamic and reciprocal. Research using continuous measures and structured tasks would help unpack these dynamics.

Second, theory and research on team conflict (Jehn and Bendersky 2003) suggest that intrateam conflict may relate to both exploratory search and team mood. Specifically, task conflict, which reflects team members' differing perspectives on and disagreements about their task, may be especially likely to occur at the midpoint (Jehn and Mannix 2001). If members fail to resolve their disagreements effectively or to use their differing perspectives to develop new insights into their work, task conflict may bleed over into relationship conflict—disagreements laden with negative emotion (Jehn and Bendersky 2003). Those teams that effectively navigate task conflicts at the midpoint may show high levels of positive mood, whereas those that struggle to resolve task conflicts may exhibit both high relationship conflict and high negative mood. Some, though little, research has explored the intersection of team mood and team conflict, identifying team mood as a potential mechanism in the transformation of one type of conflict into another (Choi and Cho 2011). Future research is needed to tease apart the effects of these tightly intertwined constructs and better document the microlevel interpersonal dynamics of temporal milestones in teams that face a deadline.

Third, a large literature in psychology indicates that positive affect directly promotes behavioral flexibility, efficient decision making, and creative ideation in individuals (e.g., Fredrickson 1998, Isen et al. 1987). Similarly, a small but growing literature suggests that shared positive moods promote creativity and effective decision making in groups (e.g., Grawitch et al. 2003, Rhee and Yoon 2012). Groups high in positive mood during early team life and at the temporal midpoint may be more efficient in experimenting with new approaches to their tasks. And because of increased behavioral flexibility, groups high in positive mood at the midpoint may be more adept at ramping down their focus on search over time. Such effects are not inherently at odds with a mood-as-input explanation for how teams change in exploratory search over time. However, it is possible that the members of teams high in positive mood are

more sensitive to changing contextual factors or are better equipped to change their behavior in response to these factors. Scant research has explored the intersection of theories of team mood that emphasize effects on group cognition (i.e., team members' effectiveness in making decisions) with theories that emphasize effects on a group's strategic focus (i.e., how team members allocate their effort or time). Research that reconciles these effects is needed to advance understanding of how mood influences group processes and outcomes.

What factors influence group transitions? This study indicates that one motor of change in teams that face a deadline is mood at the midpoint. Team positive mood, such as shared feelings of happiness or warmth, seems to promote a highly adaptive trajectory of team exploratory search over time; team negative mood at the midpoint, such as shared feelings of sadness or gloom, sustains exploratory search efforts even as the deadline draws near. Affective dynamics may thus be at the heart of understanding how and why different teams change in different ways over the course of time.

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Appendix. Survey Measures

Team Exploratory Search

1. This week we focused on discovering new ways of completing the competition obstacles.
2. We devoted considerable time and energy this week to radically altering how we execute certain obstacles.
3. Our primary concern this week was to search out the best possible way for completing the competition obstacles.
4. This week we sought out new information that led us to make important changes in how we accomplish certain competition tasks.
5. This week members spoke up to test assumptions about how we complete our tasks.
6. This week team members explored one another's ideas to invent new or better ways for completing the competition obstacles.

Team Positive Mood

1. Pleasant
2. Optimistic
3. Happy
4. Warm

Team Negative Mood

1. Unhappy
2. Gloomy
3. Pessimistic
4. Lethargic[4]
5. Depressed
6. Sad

Team Formation Activity

1. My team has already trained at an intense level.
2. I meet with my team members frequently about the competition.
3. My team's training is off to a fast start.
4. My team has already made significant progress in preparing for the competition.
5. My team has a plan in place for preparing for the competition.

Endnotes

[1]My use of the terms "positive" and "negative" to refer to the poles of the valence dimension aligns with usage in the mood-as-input literature and should not be confused with a different model of affect (i.e., Watson et al. 1988), which uses the same terms to refer to positive and negative affective states that are highly activated. For my predictions, valence is the most theoretically relevant dimension.

[2]There were no significant effects of individual demographics (i.e., age, gender, experience) or individual trait affectivity (i.e., positive, negative) on nonresponse to surveys after T0.

[3]I used Amazon Mechanical Turk to ensure the words fit these categories. Individuals categorized words as task-focused ("reflecting the process of preparation, the activities and actions that team members do…") or performance-focused ("reflecting big-picture team goals or objectives, evaluation of how well the team is doing, and the deadline…"). Each word was categorized 12–20 times; 64%–100% of categorizations were correct (median = 90%), with four words less than 80%. Removing these did not change my findings.

[4]Item removed because of relatively high variance in factor loadings over time.

References

Anderson NR, De Dreu C, Nijstad B (2004) The routinization of innovation research: A constructively critical review of the state of the science. *J. Organ. Behav.* 25:147–173.

Argote L (1999) *Organizational Learning: Creating, Retaining, and Transferring Knowledge* (Kluwer, Norwell, MA).

Barsade SG (2002) The ripple effect: Emotional contagion and its influence on group behavior. *Admin. Sci. Quart.* 47:644–675.

Barsade SG, Gibson DE (2007) Why does affect matter in organizations? *Acad. Management Perspect.* 21:36–59.

Barsade SG, Gibson DE (2012) Group affect: Its influence on individual and group outcomes. *Current Directions Psych. Sci.* 21(2):119–123.

Barsade SG, Knight AP (2013) Group affect. Weiss H, ed. *The Oxford Handbook of Work Attitudes and Affect* (Oxford University Press, Oxford, UK). Forthcoming.

Bartel CA, Saavedra R (2000) The collective construction of work group moods. *Admin. Sci. Quart.* 45:197–231.

Biesanz JC, Deeb-Sossa N, Papadakis A, Bollen K, Curran PJ (2004) The role of coding time in estimating and interpreting growth curve models. *Psych. Methods* 69(1):30–52.

Bliese P (2000) Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. Klein K, Kozlowski S, eds. *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions* (Jossey-Bass, San Francisco), 349–381.

Bliese P, Ployhart R (2002) Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organ. Res. Methods* 5:362–387.

Carver CS, Scheier MF (1990) Origins and functions of positive and negative affect: A control-process view. *Psych. Rev.* 97:19–35.

Chan D (1998a) Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *J. Appl. Psych.* 83:234–246.

Chan D (1998b) The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis (LMACS) and multiple indicator latent growth modeling (MLGM). *Organ. Res. Methods* 1:421–483.

Chen G (2005) Newcomer adaptation in teams: Multilevel antecedents and outcomes. *Acad. Management J.* 48:101–116.

Chernick M (2011) *Bootstrap Methods: A Practitioner's Guide* (John Wiley & Sons, New York).

Choi K, Cho B (2011) Competing hypotheses analyses of the associations between group task conflict and group relationship conflict. *J. Organ. Behav.* 32:1106–1126.

Cronin MA, Weingart LR (2011) Dynamics in groups: Are we there yet? *Acad. Management Ann.* 5:571–612.

Damasio A (1994) *Descartes' Error: Emotion, Reason, and the Human Brain* (Grosset, New York).

Edmondson AC (1999) Psychological safety and learning behavior in work teams. *Admin. Sci. Quart.* 44:350–383.

Edmondson AC, Dillon JR, Roloff KS (2007) Three perspectives on team learning. *Acad. Management Ann.* 6:269–314.

Ericksen J, Dyer L (2004) Right from the start?: Exploring the effects of early team events on subsequent project team development and performance. *Admin. Sci. Quart.* 49:438–471.

Ford C, Sullivan DM (2004) A time for everything: How the timing of novel contributions influences project team outcomes. *J. Organ. Behav.* 25:279–292.

Fredrickson B (1998) What good are positive emotions? *Rev. General Psych.* 2:300–319.

Gelman A, Hill J (2007) *Data Analysis Using Regression and Multilevel/Hierarchical Models* (Cambridge University Press, New York).

George J (1990) Personality, affect, and behavior in groups. *J. Appl. Psych.* 75:107–116.

George J (2011) Dual tuning: A minimum condition for understanding affect in organizations. *Organ. Psych. Rev.* 1:147–164.

George J, Brief A (1996) Motivational agendas in the workplace: The effects of feelings on focus of attention and work motivation. Staw B, Cummings L, eds. *Research in Organizational Behavior*, Vol. 18 (JAI Press, Greenwich, CT), 75–110.

George J, Zhou J (2002) Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *J. Appl. Psych.* 87:687–697.

Gersick C (1988) Time and transition in work teams: Toward a model of group development. *Acad. Management J.* 31:9–41.

Gersick C (1989) Marking time: Predictable transitions in task groups. *Acad. Management J.* 32:274–309.

Gersick C (1991) Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Acad. Management Rev.* 16:10–36.

Gersick C (1994) Pacing strategic change: The case of a new venture. *Acad. Management J.* 37:9–45.

Gersick C, Hackman J (1990) Habitual routines in task-performing groups. *Organ. Behav. Human Decision Processes* 47:65–97.

Gibson C, Vermeulen F (2003) A healthy divide: Subgroups as a stimulus for team learning behavior. *Admin. Sci. Quart.* 48:202–239.

Grawitch MJ, Munz DC, Kramer TJ (2003) Effects of member mood states on creative performance in temporary workgroups. *Group Dynam.: Theory, Res., Practice* 7:41–54.

Grawitch MJ, Munz DC, Elliott EK, Mathis A (2003) Promoting creativity in temporary problem-solving groups: The effects of positive mood and autonomy in problem definition on idea-generating performance. *Group Dynam.: Theory, Res., Practice* 7:200–213.

Hackman J (1987) The design of work teams. Lorsch J, ed. *Handbook of Organizational Behavior* (Prentice-Hall, Englewood Cliffs, NJ), 315–342.

Hackman J, Katz N (2010) Group behavior and performance Fiske ST, Gilbert DT, Lindzey G, eds. *Handbook of Social Psychology* (John Wiley & Sons, New York), 1208–1251.

Hirt ER, Devers EE, McCrea SM (2008) I want to be creative: Exploring the role of hedonic contingency theory in the positive mood-cognitive flexibility link. *J. Personality Soc. Psych.* 94:645–656.

Hirt ER, Melton RJ, McDonald HE, Harackiewicz JM (1996) Processing goals, task interest, and the mood-performance relationship: A mediational analysis. *J. Personality Soc. Psych.* 71:245–261.

Hirt ER, Levine GM, McDonald HE, Melton RJ, Martin LL (1997) The role of mood in quantitative and qualitative aspects of performance: Single or multiple mechanisms? *J. Experiment. Soc. Psych.* 33:602–629.

Hofmann DA, Gavin MB (1998) Centering decisions in hierarchical linear models: Implications for research in organizations. *J. Management* 24:623–641.

Hülsheger UR, Anderson N, Salgado JF (2009) Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *J. Appl. Psych.* 94:1128–1145.

Isen AM, Daubman KA, Nowicki GP (1987) Positive affect facilitates creative problem solving. *J. Personality Soc. Psych.* 52:1122–1131.

Ishak AW, Ballard DI (2012) Time to re-group: A typology and nested phase model for action teams. *Small Group Res.* 43:3–29.

James LR, Demaree RG, Wolf G (1984) Estimating within-group interrater reliability with and without response bias. *J. Appl. Psych.* 69:85–98.

Janssen O, van de Vliert E, West M (2004) The bright and dark sides of individual and group innovation: A special issue introduction. *J. Organ. Behav.* 25:129–145.

Jehn KA, Bendersky C (2003) Intragroup conflict in organizations: A contingency perspective on the conflict-outcome relationship. Staw BM, Kramer RM, eds. *Research in Organizational Behavior*, Vol. 25 (JAI Press, Greenwich, CT), 187–242.

Jehn KA, Mannix EA (2001) The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Acad. Management J.* 44:238–251.

Jones EE, Kelly JR (2009) No pain, no gains: Negative mood leads to process gains in idea-generation groups. *Group Dynam.: Theory, Res., Practice* 13:75–88.

Kelly JR, Barsade SG (2001) Mood and emotions in small groups and work teams. *Organ. Behav. Human Decision Processes* 86:99–130.

Klein K, Bliese P, Kozlowski S, et al. (2000) Multilevel analytical techniques: Commonalities, differences, and continuing questions. Klein K, Kozlowski S, eds. *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions* (Jossey-Bass, San Francisco), 512–553.

Kozlowski S, Klein K (2000) A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. Klein K, Kozlowski S, eds. *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions* (Jossey-Bass, San Francisco), 3–90.

Larsen R, Diener E (1992) Promises and problems with the circumplex model of emotion. Clark MS, ed. *Emotion* (Sage, Thousand Oaks, CA), 25–59.

March J (1991) Exploration and exploitation in organizational learning. *Organ. Sci.* 2:71–87.

March J, Simon HA (1958) *Organizations* (John Wiley & Sons, New York).

Marks MA, Mathieu JE, Zaccaro SJ (2001) A temporally based framework and taxonomy of team processes. *Acad. Management Rev.* 26:356–376.

Martin L, Stoner P (1996) Mood as input: What we think about how we feel determines how we think. Martin LL, Tesser A, eds. *Striving and Feeling: Interactions Among Goals, Affect, and Self-Regulation* (Lawrence Erlbaum Associates, Mahwah, NJ), 279–301.

Martin L, Abend T, Sedikides C, Green JG (1997) How would I feel if…? Mood as input to a role fulfillment evaluation process. *J. Personality Soc. Psych.* 73:242–253.

Martin L, Ward D, Achee J, Wyer R (1993) Mood as input?: People have to interpret the motivational implications of their moods. *J. Personality Soc. Psych.* 64:317–326.

Mathieu JE, Rapp TL (2009) Laying the foundation for successful team performance trajectories: The roles of team charters and performance strategies. *J. Appl. Psych.* 94:90–103.

Mathieu JE, Schulze W (2006) The influence of team knowledge and formal plans on episodic team process-performance relationships. *Acad. Management J.* 49:605–619.

McGrath JE (1986) Studying groups at work: Ten critical needs for theory and practice. Goodman P, ed. *Designing Effective Work Groups* (Jossey-Bass, San Francisco), 362–392.

Meeten F, Davey GCL (2011) Mood-as-input hypothesis and perseverative psychopathologies. *Clinical Psych. Rev.* 31:1259–1275.

Mitchell TR, James LR (2001) Building better theory: Time and the specification of when things happen. *Acad. Management Rev.* 26:530–547.

Mohr J (2004) *Gasping for Airtime: Two Years in the Trenches of Saturday Night Live* (Hyperion, New York).

Okhuysen GA, Waller MJ (2002) Focusing on midpoint transitions: An analysis of boundary conditions. *Acad. Management J.* 45:1056–1065.

Ployhart RE, Vandenberg RJ (2009) Longitudinal research: The theory, design, and analysis of change. *J. Management* 36:94–120.

Preacher KJ, Curran PJ, Bauer DJ (2006) Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *J. Ed. Behav. Statist.* 31:437–448.

Rhee S, Yoon H (2012) Shared positive affect in workgroups. Cameron K, Spreitzer G, eds. *The Oxford Handbook of Positive Organizational Scholarship* (Oxford University Press, Oxford, UK), 215–228.

Sanna LJ, Turley KJ, Mark MM (1996) Expected evaluation, goals, and performance: Mood as input. *Personality Soc. Psych. Bull.* 22:323–335.

Schwarz N (2012) Feelings-as-information theory. Van Lange P, Kruglanski A, Higgins E, eds. *Handbook of Theories of Social Psychology*, Vol. 1 (Sage, Thousand Oaks, CA), 289–308.

Schwarz N, Clore G (1983) Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *J. Personality Soc. Psych.* 45:513–523.

Schwarz N, Clore G (1996) Feelings and phenomenal experiences. Higgins E, Kruglanski A, eds. *Social Psychology: Handbook of Basic Principles* (Guilford, New York), 433–465.

Seers A, Woodruff S (1997) Temporal pacing in task forces: Group development or deadline pressure? *J. Management* 23:169–187.

Shales T, Miller JA (2002) *Live from New York: An Uncensored History of Saturday Night Live* (Back Bay Books, New York).

Shteynberg G, Hirsh JB, Galinsky AD, Knight AP (2014) Shared attention increases mood infusion. *J. Experiment. Psych.: General* 143:123–130.

Simon HA (1967) Motivational and emotional controls of cognition. *Psych. Rev.* 74:29–39.

Singer JD, Willett JB (2003) *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence* (Oxford University Press, Oxford, UK).

Staudenmayer N, Tyre M, Perlow L (2002) Time to change: Temporal shifts as enablers of organizational change. *Organ. Sci.* 13:583–597.

Sy T, Côté S, Saavedra R (2005) The contagious leader: Impact of the leader's mood on the mood of group members, group affective tone, and group processes. *J. Appl. Psych.* 90:295–305.

Totterdell P, Kellett S, Teuchmann K, Briner RB (1998) Evidence of mood linkage in work groups. *J. Personality Soc. Psych.* 74:1504–1515.

Van Kleef GA, Homan AC, Beersma B, van Knippenberg D, van Knippenberg B, Damen F (2009) Searing sentiment or cold calculation? The effects of leader emotional displays on team performance depend on follower epistemic motivation. *Acad. Management J.* 52:562–580.

van Knippenberg D, Kooij-de Bode HJM, van Ginkel WP (2010) The interactive effects of mood and trait negative affect in group decision making. *Organ. Sci.* 21:731–744.

Vaughn LA, Malik J, Schwartz S, Petkova Z, Trudeau L (2006) Regulatory fit as input for stop rules. *J. Personality Soc. Psych.* 91:601–611.

Waller MJ, Zellmer-Bruhn ME, Giambatista RC (2002) Watching the clock: Group pacing behavior under dynamic deadlines. *Acad. Management J.* 45:1046–1055.

Watson D, Clark L, Tellegen A (1988) Development and validation of brief measures of positive and negative affect: The PANAS scales. *J. Personality Soc. Psych.* 54:1063–1070.

Weiss HM (2002) Conceptual and empirical foundations for the study of affect at work. Lord R, Klimoski R, Kanfer R, eds. *Emotions in the Workplace: Understanding the Structure and Role of Emotions in Organizations* (Jossey-Bass, San Francisco), 20–63.

West M (2002) Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation within groups. *Appl. Psych.: Internat. Rev.* 51:355–424.

West M, Farr J (1990) Innovation at work. West M, Farr J, eds. *Innovation and Creativity at Work: Psychological and Organizational Strategies* (John Wiley & Sons, Chichester, UK), 3–13.

Wong S (2004) Distal and local group learning: Performance tradeoffs and tensions. *Organ. Sci.* 15:645–656.

Woolley AW (1998) Effects of intervention content and timing on group task performance. *J. Appl. Behav. Sci.* 34:30–46.

Woolley AW (2009) Means vs. ends: Implications of process and outcome focus for team adaptation and performance. *Organ. Sci.* 20:500–515.

Zajonc R (1980) Feeling and thinking: Preferences need no inferences. *Amer. Psychologist* 35:151–175.

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