

Teams under Threat: The Effects of a Transactive Memory Training

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Individuals encountering acute crisis situations during their work often do not face these situations alone, but as part of a team. The crisis situation may not only affect individual task performance, but also the way these individuals work together. Their team performance is qualitatively different from their individual performance; team members occupy different roles, resulting in a need for coordination, synchronization, and exchange of information. Although individual level stress reactions in crisis situations have received much research attention, considerably less research has been done to investigate the effects of threat and stress on the performance of teams, and to develop ways to mitigate these effects. The current study focuses on team performance in threatening circumstances and the effects of a training designed to reduce the possibly debilitating effects of stress.

Research suggests that in teams, a *transactive memory system* (Wegner, Giuliano, & Hertel, 1985, Wegner, 1987) helps team members to distribute and retrieve information efficiently, positively affecting team performance (e.g. Ellis, 2006; Moreland & Myaskovsky, 2000). This memory system consists of the distributed knowledge possessed by the individual members and a shared awareness of who knows what. *Team mental models*, which are cognitive structures containing a shared understanding

concerning key elements of the task, the task environment and the other team members (Cannon-Bowers, Salas, & Converse, 1993; Klimoski & Mohammed, 1994), can also contribute to successful coordination of activities within the team and ultimately team performance (e.g. Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000).

Recent research indicates that acute stress negatively affects the team mental models and the transactive memory system of a team, resulting in worse team performance (Ellis, 2006). Under threatening circumstances team members are in danger of losing their sense of being part of a team and only paying attention to their individual task performance (Driskell, Salas, & Johnston, 1999).

In the current study, we investigated (a) the effects of threat on the performance of teams during a complex task, and (b) to what extent a brief transactive memory training prior to task performance could mitigate the effects of stress on team performance. Participants were 180 officer cadets of the Netherlands Defence Academy, who were grouped into 60 triads. They engaged in a 45-minute scenario of the Planning Task for Teams (PLATT, Kamphuis & Houttuin, 2007), a complex planning and decision making task. We used a 2 (threat; high vs. low) \times 2 (transactive memory training; training vs. no training) experimental between teams design. We expected that the transactive memory training would have a positive effect on team performance and that this effect would be largest in the high threat condition.

The threat manipulation consisted of a combination of procedures that have been used to induce stress: negative performance feedback, an evaluative situation, and videotaping of task execution (cf. Blanchette, Richards, & Cross, 2007; Ellis, 2006; Mogg, Mathews, Bird, & Macgregor-Morris, 1990). Prior to engagement in the

experimental scenario, teams in the high threat condition were provided with negative feedback on an unrelated task (the Synwork task, Elsmore, 1994), said to be predictive of performance on the experimental task. In addition, the experimenter told these teams that he expected them to have more difficulty with the experimental task and that their performance would be videotaped to gain better insight into what happens in ill-performing teams. Moreover, the experimenter told them that they ran the risk of having to come back for an evaluation with their officers and the researchers if their team would be one of the five lowest performers. Finally he told them that the videotape could be used as course material. Teams in the low threat condition, on the contrary, received positive feedback on the pretest, and did not run the risk of being negatively evaluated, nor were they videotaped.

The transactive memory training consisted of (1) a videotaped instruction in which the roles of the different team members were explained, (2) a written instruction in which the most important parts of the videotaped instruction were repeated, and (3) a guided 5-minute pre-briefing in which the team members had the opportunity to discuss each others responsibilities and determine how they would allocate and retrieve information within the team.

Measures concerning information processing, leadership, team mental models and transactive memory were collected via automatic behavior recording and questionnaires. Results of this study will be discussed in the light of their implications for the use of brief transactive memory trainings in operational settings.

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