

FIRE NOTE

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THE INFLUENCE OF FAMILIARITY ON TEAMWORK AND DECISION MAKING



▲ This research investigated to what degree familiarity between team members affects the quality of teamwork and decision making in IMTs. **Photo: NSWRFs**

SUMMARY

Does it matter whether incident management team (IMT) members have previously worked together? A PhD project within the *Safe behaviour and decision making* project from the first phase of the Bushfire CRC (2003-2010) assessed teamwork and decision making differences in 32 four-person IMTs. The teams managed simulated bushfire incidents in two team familiarity conditions: (1) members had previously worked together (familiar), and (2) members had not previously worked together (unfamiliar). The findings demonstrate that familiar IMT teams' performance was clearly superior to that of unfamiliar teams. Familiar teams attended to more fireground events more effectively, produced higher quality reports, made timelier decisions, developed greater situation awareness, and showed greater intra-team trust, satisfaction, and teamwork. The greater efficiency of the familiar (pre-formed) teams suggests that these teams will be particularly valuable for managing difficult tasks or incidents. The findings also suggest that the introduction of brief résumés and question and answer sessions may help fast-forward the integration of IMT personnel who have not trained or worked together.

ABOUT THIS PROJECT

This *Fire Note* reports on a completed PhD project within the *Safe behaviour and decision making* project, part of the first phase of the Bushfire CRC (2003-2010).

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CONTEXT

Fire agencies deploy IMTs with varying familiarity between members. Because of this, an important question is to what degree familiarity between team members affects the quality of teamwork and decision making?

This PhD research investigated the teamwork and decision making differences between familiar (pre-formed) and unfamiliar (ad hoc) IMTs. Two important questions arise from the operational requirement to deploy ad hoc teams and the recent move by some fire agencies to the use of pre-formed teams:

1. In what ways do pre-formed teams perform differently to ad hoc teams in which members have not worked together previously?
2. What can fire agencies do to help members of ad hoc teams quickly become more familiar with one another?

BACKGROUND

There has been very little published research that considers how team member familiarity affects decision making and team performance in the emergency services. Although anecdotal evidence suggests that the teamwork and decision making of familiar teams tends to be better than unfamiliar or ad hoc teams, there is little empirical evidence for this.

It usually takes time for team members who haven't worked together before to gel, trust each other, and effectively coordinate their actions. Research from military, aviation, software development and medical settings indicates that familiar teams generally tend to work together more efficiently and make better quality decisions. The factors used to explain the influence of familiarity on team performance can be divided into two complementary groups:

1. mechanisms that influence the effective interaction and relationships of team members

IMT KEY COMPETENCIES IN ORDER OF IMPORTANCE

- Interpersonal and communication skills
- AIIMS knowledge and processes
- Leadership
- Calmness and level headedness
- Self-discipline
- Decision making ability
- Flexibility and adaptability
- Analytical thinking and problem solving
- Situation awareness
- Technical expertise
- Management skills
- Other (e.g. sense of humour, self-confidence and initiative)

2. mechanisms that support team coordination (Reagans, Argote and Brooks, 2005).

The distributed nature of how information is analysed and decisions are made in IMTs increases the requirements to coordinate how members share information and develop an appropriate level of team situation awareness.

This PhD project investigated the degree of influence that member familiarity has on IMT decision making and teamwork.

BUSHFIRE CRC RESEARCH

Two studies were conducted to investigate decision making and teamwork in IMTs. Study 1 used interviews to identify the key competencies required for IMT personnel. These competencies provided guidance on the types of teamwork behaviours assessed in the study 2 experimental simulations with IMTs.

STUDY 1

Fifteen experienced fire managers were interviewed to identify the key competencies required for IMT personnel. The first two interview questions were based on Flanagan's (1954) critical incident technique. Participants were asked to describe member behaviours present during an incident:

- when their IMT had successfully managed a routine incident
- when their IMT had been stretched in the management of a demanding incident.

Following this, participants were asked to free list the competencies they thought most important for working in an IMT, regardless of a person's role.

Analysis of the interviews identified 12 competencies (see box above). The three most crucial competencies cited by interviewees



▲ Analysis of IMT performance comprising of team members who had previously worked together was compared with IMT performance of team members who had not worked together.

Photo: CFA Strategic Communications

were interpersonal and communication skills, AIIMS knowledge and processes and leadership.

STUDY 2

Experimental simulation (i.e. role play) was used to assess the teamwork and decision making differences between small ad hoc (unfamiliar) and pre-formed (familiar) IMTs managing two bushfire scenarios. There was an equal distribution, with 16 familiar and 16 unfamiliar teams.

Each participant undertook two simulation scenarios; once as a member of a team where they were unfamiliar with colleagues, and once in a team where they had worked with their colleagues previously. The two simulation scenarios undertaken by each participant were based on different bushfires. All of the simulations were observed by a seasoned level 3 incident controller from a separate fire agency.

The experienced incident management personnel worked for just over two hours in teams of four to complete a variety of tasks, including situation reporting, preparing a media release, advising the local community, and providing a handover briefing for the following IMT shift.

The performance of the IMTs was assessed from:

- the quality of the reports and briefings produced

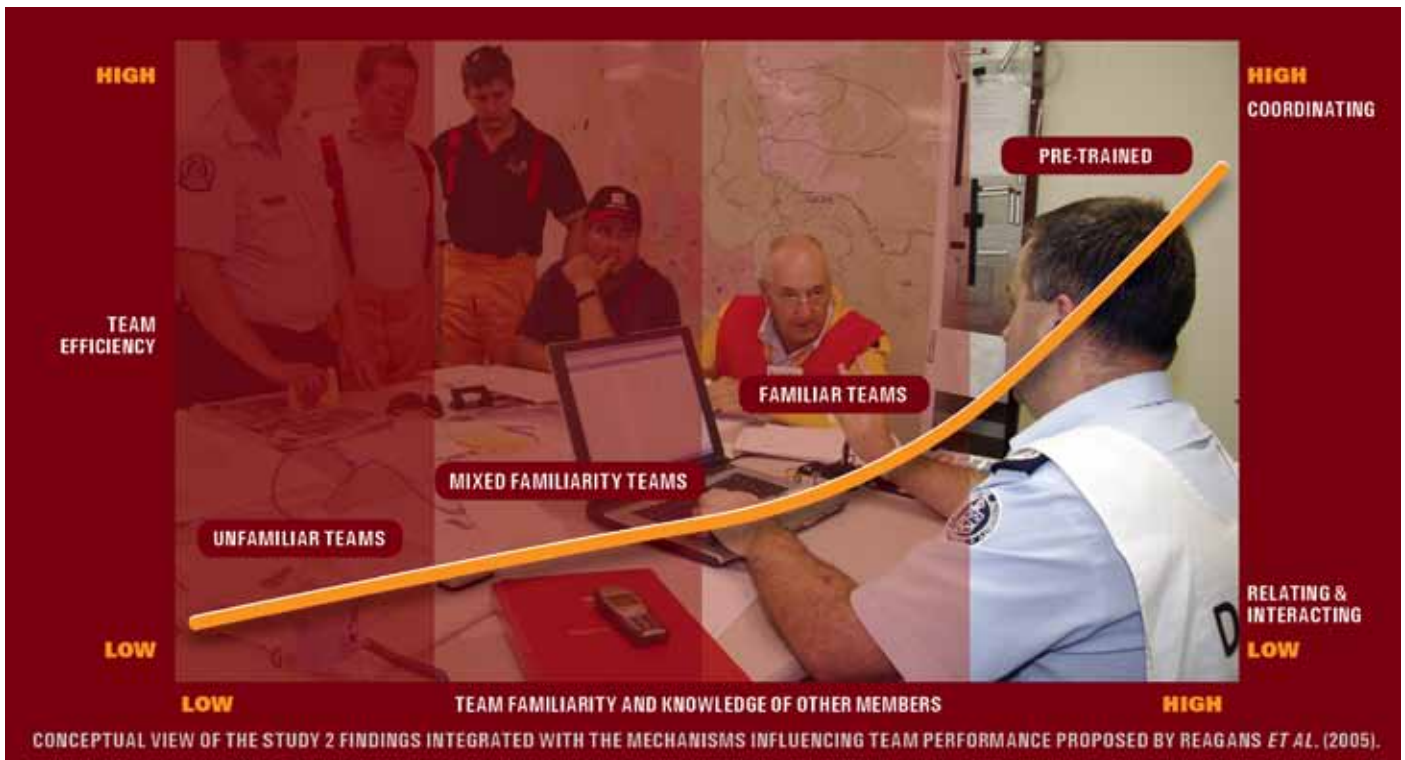
- observations made by the observing level 3 incident controllers
- individual participant self-report questionnaires.

RESEARCH OUTCOMES

The familiar teams' performance in study 2 was clearly superior to that of unfamiliar teams. Familiar teams attended to more fireground events more effectively, produced higher quality reports, made timelier decisions, developed greater situation awareness, and showed greater intra-team trust, satisfaction and teamwork.

The research findings highlight that previous member experience of training or working together tends to affect the performance of an IMT. Some of the IMTs that undertook the simulations were a mixture of personnel that both had and had not trained or worked together previously (i.e. mixed familiarity). Interestingly, the performance of the mixed familiarity teams was almost identical to the unfamiliar teams, and clearly less effective than the familiar teams. This curvilinear pattern of results suggests that there may be more at play than just simply member familiarity shaping team performance. In other words, pre-training teams (i.e. pre-formed) seems to provide an incremental benefit over and above familiar team members working together.

The pre-training of IMTs is designed to enable teams to rapidly commence management of



an incident in a seamless manner. The term ‘familiar’ suggests that team members have developed some degree of rapport. Depending on the nature and duration of their previous shared experiences, familiar team members may also have developed some understanding of each other’s backgrounds and relevant work experience. However, familiarity by itself does not necessarily ensure team members have sufficient understanding and knowledge of one another in specific roles that will support high levels of team coordination.

The pre-training of pre-formed teams can help ensure clarity of member roles and responsibilities, and develop the capacity to use implicit coordination (i.e. anticipate other member’s actions and requirements), Moreover, pre-training can help ensure that teams are able to allocate suitable work to members.

In sum, the results from study 2 suggest that pre-training supports greater member interpredictability than simple familiarity and thus may further aid team coordination and performance.

The graphic above integrates the study 2 findings with the Reagans *et al.* (2005) perspective of how team familiarity influences team performance. A pre-trained team is likely to commence operating at a higher level of efficiency than a merely familiar team. The graphic suggests that the mechanisms of member interaction and relationships, and team coordination, tend to evolve in a team. In the early stages of a team whose members are new to one another, member interaction and relationship development will tend to

END USER STATEMENT

As an Incident Controller at many large incidents I have experienced first-hand the difference in performance of an ad hoc team compared to one that has worked together previously. The time it takes to form a cohesive team can take many shifts, and in most instances there is not enough time for this to occur in a dynamic fire situation, where the community expects high performance. This PhD research provides invaluable insights not only into the performance differences between pre-formed and ad hoc teams, but also useful suggestions on how to get the most out of IMT teams that must be put together in the traditional ad hoc fashion.

– John Haynes, Deputy Chief Officer, Country Fire Authority Victoria

be prevalent. As the team trains or works together, there will be an increasing focus on coordinating team and member activities.

HOW COULD THIS RESEARCH BE USED?

The evidence from this project suggests that teams that regularly train or work together tend to be more effective than ad hoc teams. The greater efficiency of the pre-formed teams suggests that these teams will be particularly valuable for managing difficult tasks or incidents.

However, it is likely that there are going to be situations where emergency service agencies need to deploy ad hoc teams. Therefore, how does an agency assist members of ad hoc

teams to more quickly become familiar with each other so they may perform more like the pre-formed teams?

The findings from this PhD research project suggest that there are two types of intervention that may assist members of ad hoc teams to work more effectively together – brief résumés and brief question and answers. The aim of these interventions is to improve the ability of team members to coordinate their actions, and this is achieved through developing team member knowledge of each other and fostering effective working relationships.

Brief résumés

Brief résumés provide the opportunity for managers and team members to rapidly appraise the likely capability of personnel who they may not have worked with before. Developing good teams is not only about placing good performers in the key roles, but also ensuring that personnel don’t end up in the wrong role and thus undermine team performance. The Levine *et al.* (2005) study of team member turnover suggests that brief résumés may help teams more quickly and successfully integrate newcomers.

Effective résumés should be concise, easy to read, and include information such as recent incidents the person has worked on, their role within each team, and their team leader or line manager for each deployment. A summary of a person’s experience, including the number of relevant shifts undertaken in the last five years, agency accreditations or endorsements, and ancillary skills are also useful. Ideally, résumés for every member would be available to all team members. This

enables personnel new to a team, as well as existing members, to read about each other's backgrounds.

Brief question and answer

This is a simple method that some experienced team leaders use to help assess personnel who they haven't worked with before. The team leader asks a few simple questions about the new team member's experiences of working in teams. This may be done in a reasonably informal way as a brief chat. This may enable team leaders to gather information about the capability of personnel by asking about the last two or three incidents that they have worked on. Questions typically probe the person's role and responsibilities, the nature of the incident, the size of the team, who was their team or section leader, and how comfortable they felt in undertaking their duties.

The brief question and answer (Q&A) fulfils two main functions. First, it provides further information about the likely capability of the unfamiliar team member and thus should help ensure the person is allocated to a suitable role. The second function is to develop rapport between the unfamiliar team member and their new colleagues. Research suggests the central role that high quality social relationships play within teams supports knowledge integration. A simple conversation is likely to help newcomers feel a little more at ease in the new team environment and thus more willing to make helpful comments and suggestions that may assist the team to function effectively. If this Q&A becomes routine in teams, then it is likely to be accepted, and will not risk prompting concerns that new team members are being subject to a personal examination.

FUTURE DIRECTIONS

An extension of this research would be to develop knowledge around whether there was a particular time interval since last working together at which a clear deterioration in teamwork processes and



Photo: CFA Strategic Communications

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the quality of team outputs became apparent (i.e. half-life). Research such as this would help identify how often pre-formed teams are likely to need to exercise (pre-train) to retain a suitable level of performance, and provide the opportunity to potentially develop a model of decay for teamwork processes when not practised. There has been some research completed that has considered skill decay in various military settings (e.g. Chatham, 2009), but little research that has focused on teamwork processes, especially in emergency services settings.

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