Breakdowns in Coordinated Decision Making

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→ Breakdowns

"The CFS officers ...were finding it extremely difficult to obtain any relevant information about the fire, its status and its size...There was a large measure of frustration experienced in Port Lincoln about the adequacy of information from the fire ground.

"Mr <A> stated in evidence that he attempted to contact the Kilmore ICC to pass the information on, without success. He did not know whether the Kilmore ICC was releasing this type of information."

There is in the evidence some conflict about whether or not it was agreed at the meeting that using the Baldy Range trail as the eastern containment line would be reconsidered the following morning

Breakdowns and Disconnects

- Breakdown = "a failure in coordination, cooperation or communication that leads to a temporary loss in the ability to function effectively."

- Disconnect = "individual instances of disagreement between participants."

(Bearman, Paletz, Orasanu & Thomas 2010)

Disconnects

- *Operational disconnects*
    - a difference between the actions of one party and actions expected by the other party, or
    - a mismatch in the plans that each party has about the physical operations of the response
- *Informational disconnects*
    - a difference in the information that each party possesses.
- *Evaluative disconnects*
    - a difference in the evaluation or appraisal of information that is available to both parties

Shared Mental Models

- A mental model is a cognitive structure that a person uses to signify objects, actions, situations and people (Johnson-Laird, 1980)

- A shared mental model "enables team members to have more accurate expectations and a compatible approach for task performance" (Salas & Cannon-Bowers, 2001, p. 87)
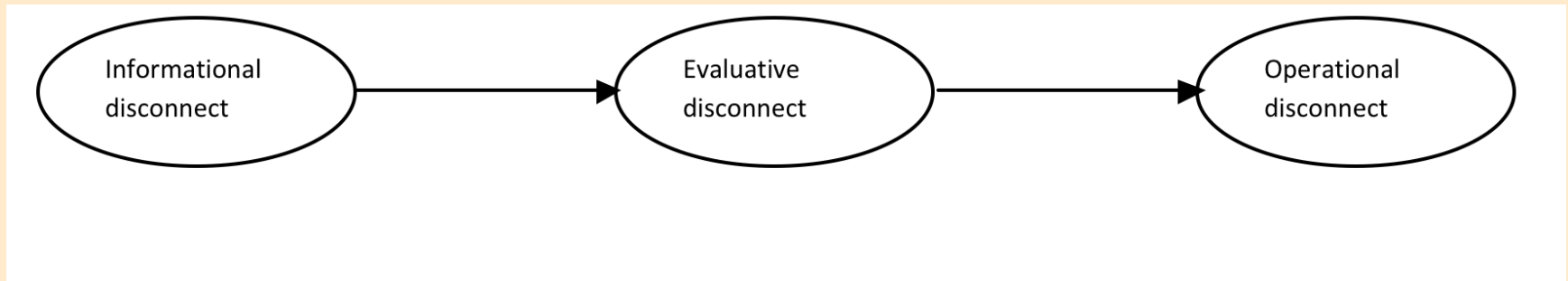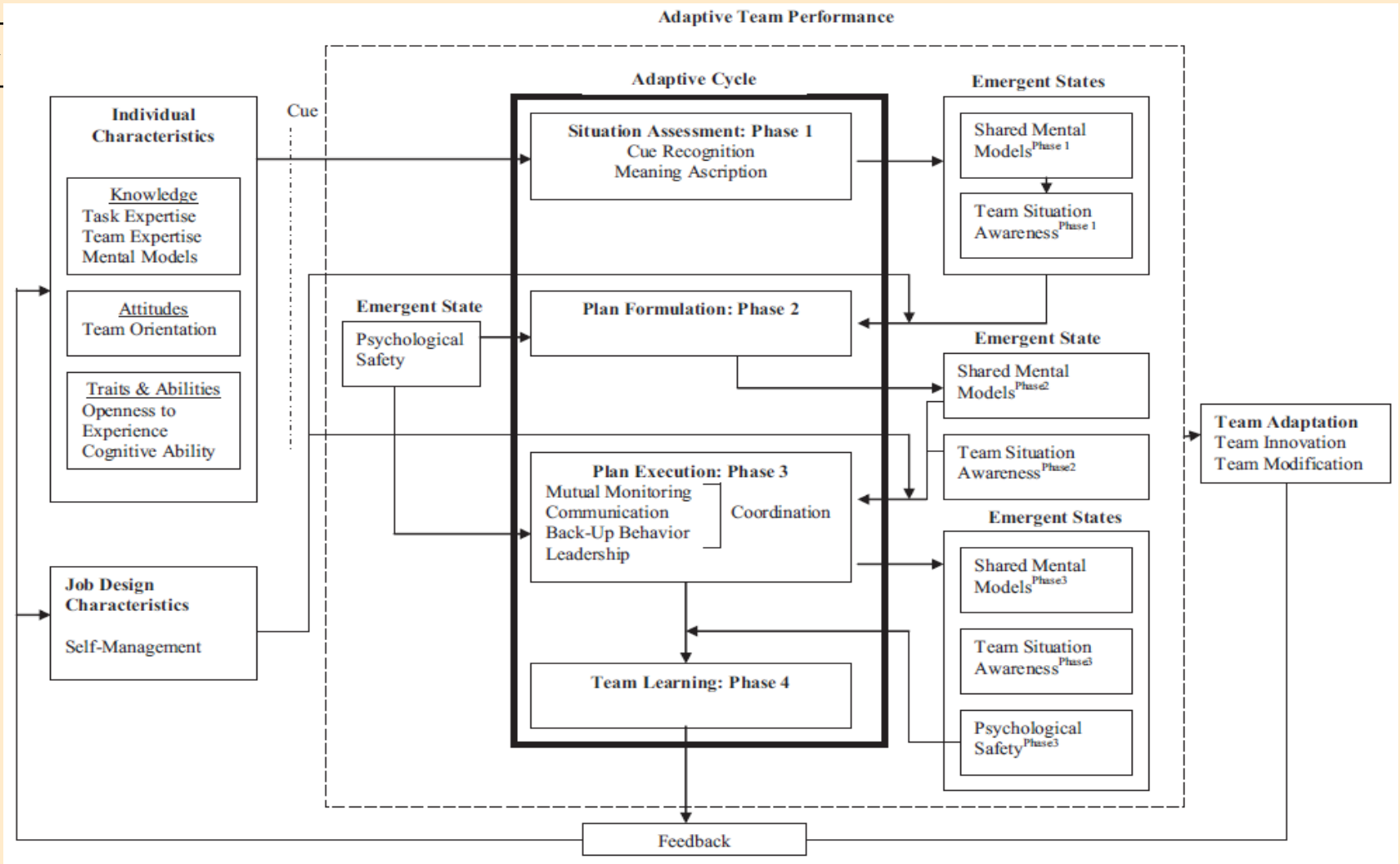
Adaptive Team Performance
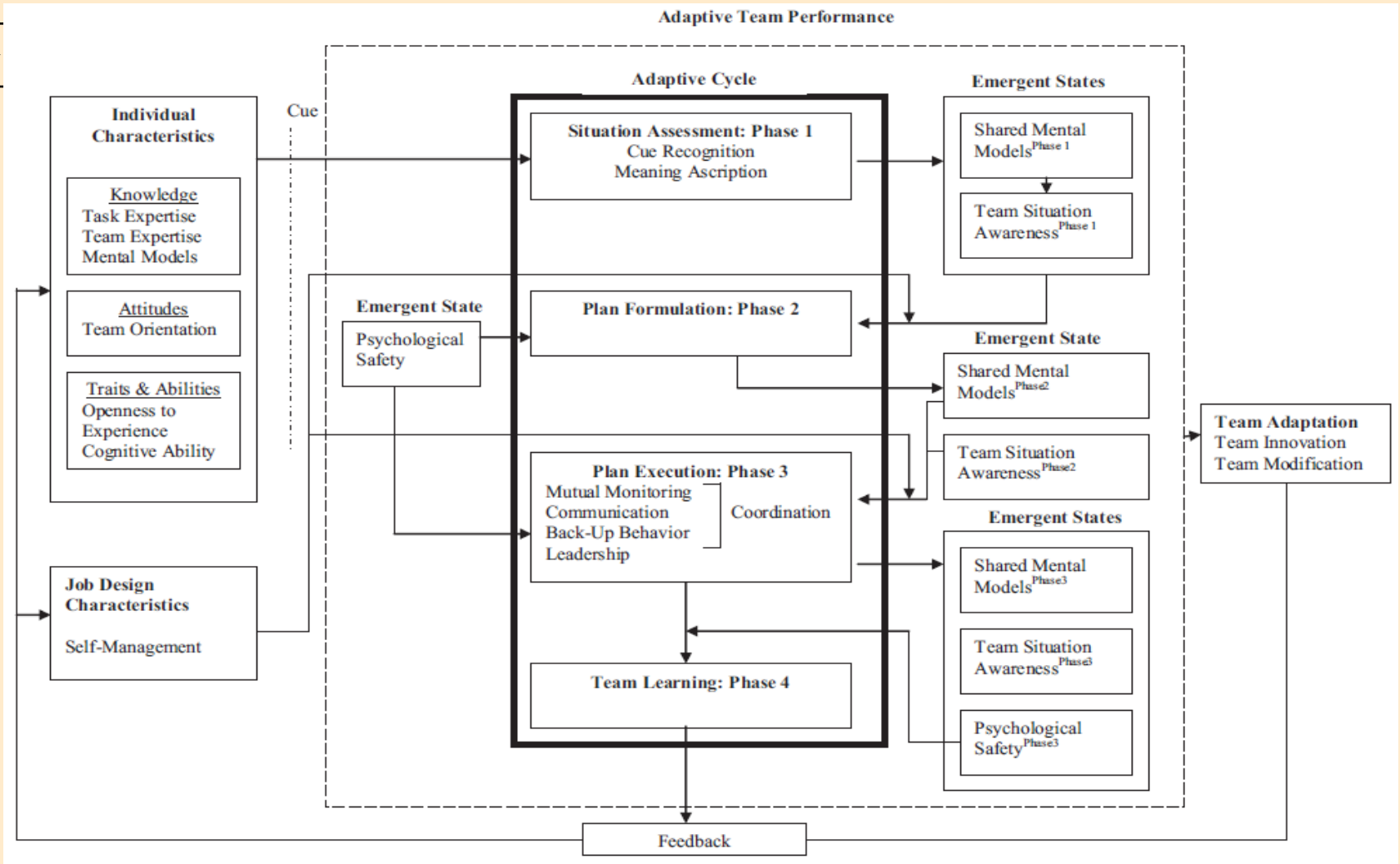
Canberra Firestorm

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"There is in the evidence some conflict about whether or not it was agreed at the meeting that using the Baldy Range trail as the eastern containment line would be reconsidered the following morning. Mr <A>'s memory was that they were going to try to use the Baldy Range trail as the first option, the fall-back option being Dingo Dell Road. He was definite that at no stage did he convey any opinion that, on the basis of the information he had from Mr <B>, the Baldy Range trail could not be used as a containment line because of the intensity of the fire burning across it."

Disconnect Chain

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┌─────────────────┐        ┌─────────────────┐        ┌─────────────────┐
│  Informational  │───────▶│   Evaluative    │───────▶│   Operational   │
│   disconnect    │        │   disconnect    │        │   disconnect    │
└─────────────────┘        └─────────────────┘        └─────────────────┘
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Adaptive Team Performance

Breakdowns in 3 Large-Scale Fires

- Combined top-down & bottom-up analysis technique

- Identified situations that *prima facie* contained a breakdown

- A random selection of these situations were analyzed further for

  - Types of Disconnects

  - Causes of Disconnects

  - Resolution

Results

- ## 44 breakdowns yielded 84 disconnects
- ## Types
  - ### Operational = 32
  - ### Informational = 41
  - ### Evaluative = 11
- ## Resolution
  - ### Operational 5/32
  - ### Informational 3/41
  - ### Evaluative 10/11

Causes of Informational Disconnects

- Lack of feedback (4)
- Difficulties in sending/receiving information (7)
- Information not shared/distributed (30)

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Causes of Operational Disconnects

- Assumptions that work will be carried out (16)

- Procedures or responsibilities unclear/ambiguous (9)

- Going against set procedure (5)

- Disagreements about the interpretation of fire information or duties (5)

- Plans not satisfactorily carried out (1)

Causes of Evaluative Disconnects

- Wanting to go against procedure (4)
- Disagreement about operational deployment (7)

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Simple Strategies to Avoid Unnecessary Disconnects

- Ensure Procedures and Responsibilities are Clear

- Make Sure Important Information is Shared With Others

- Use Closed Loop Communication

- Check That Work is Being Carried Out Correctly