Modeling coordination in team dynamic resource allocation

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Dynamic Decision Making (DDM)

- Multiple and interdependent decisions
- Continuously changing independent environment (exogenous events)
- Decisions made in real-time
Coordination in Team DDM

Coordinate

“Managing dependencies between activities” Malone and Crowston (1994)

“Joint efforts of independent actors towards mutually defined goals” [NSF, 1989]

Coordination in Team DDM

Allocation of tasks and sharing information should occur at the right time and accurately

How is coordination developed in a team dynamic task?
Task: Team Pipes
Team Pipes: Coordination Issues

- Same task, same goal, but different processing requirements (exogenous events: amounts of water)

- **Coordination requirements**
  - Paying attention to my partner's work
  - Considering my partner's workload in my decisions
  - Determine actions to balance workload (give help, request help)
  - Communicating those actions
  - Executing those actions on time
General architecture

Participant 1

Simulation 1

Participant 2

Simulation 2

Social and Decision Sciences
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Instance-Based Decision Making

Situation-Decision-Utility instances

- Utility is the result of: a heuristic or blending previous similar instances
- Different from Act-R utility
Coordination issues

Coordination is just another decision (SDU chunk, Decision: send water to my partner)

- Recognition: be aware of partner’s situation
- Judgment: Utility is no longer my own
- Choice: individual and team Utility

Communication and social issues
The cognitive Models: coordination issues

Current Models Assume:

- "75/25 assumption": 75% attention to my work, 25% attention to my partner’s work
- "Selfish assignment": Transfer water if my situation is more urgent than my partner’s
- "Friendly acceptance": Always accept my partner’s requests
The cognitive Models: Demo
Human Data: team performance

![Graph showing missed gallons of water over trials]
Human Data: coordination
Feedback, References, Ideas