

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

Coordination

- “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?

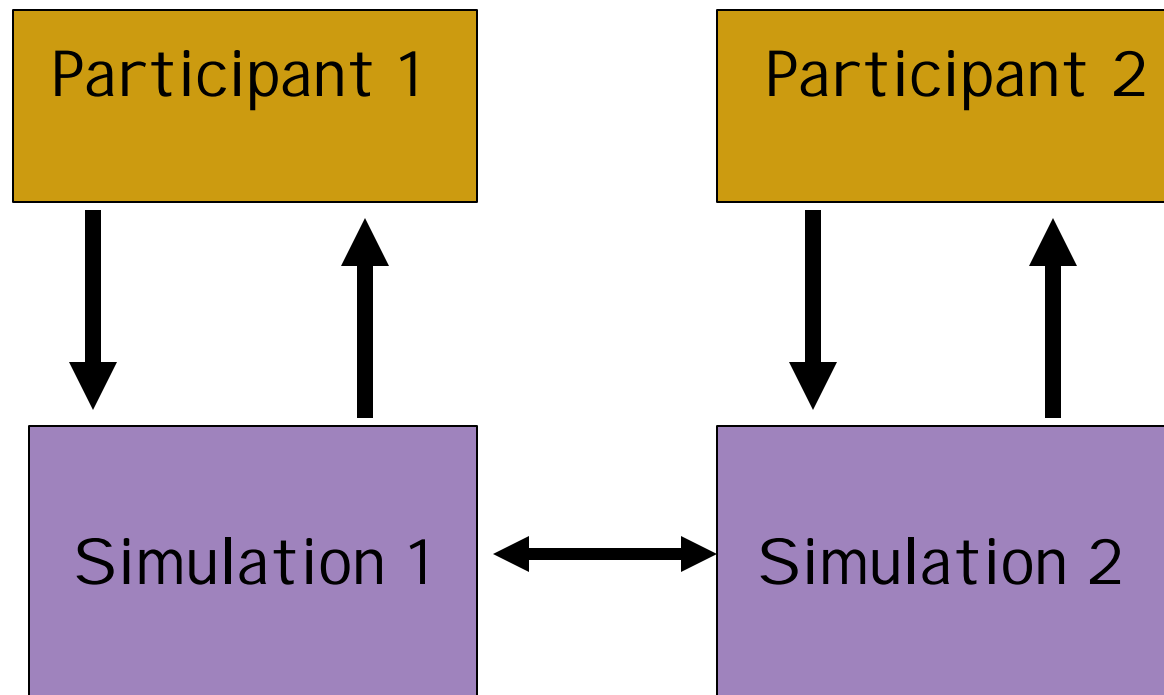
Task: Team Pipes



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

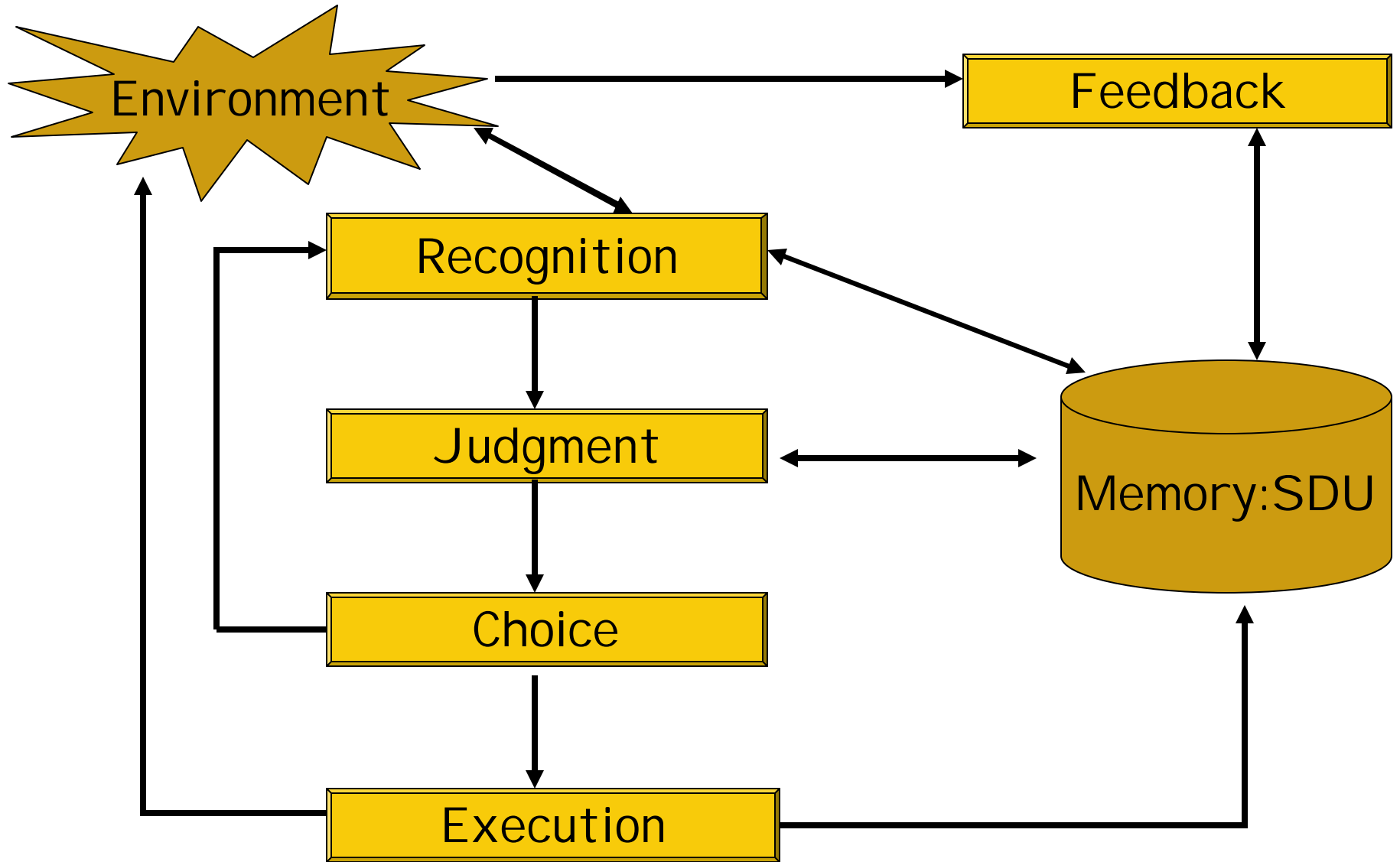


Instance-Based Decision Making



- # Situation-Decision-Utility instances
 - Utility is the result of: a heuristic or blending previous similar instances
 - Different from Act-R utility

PRODUCTIONS



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

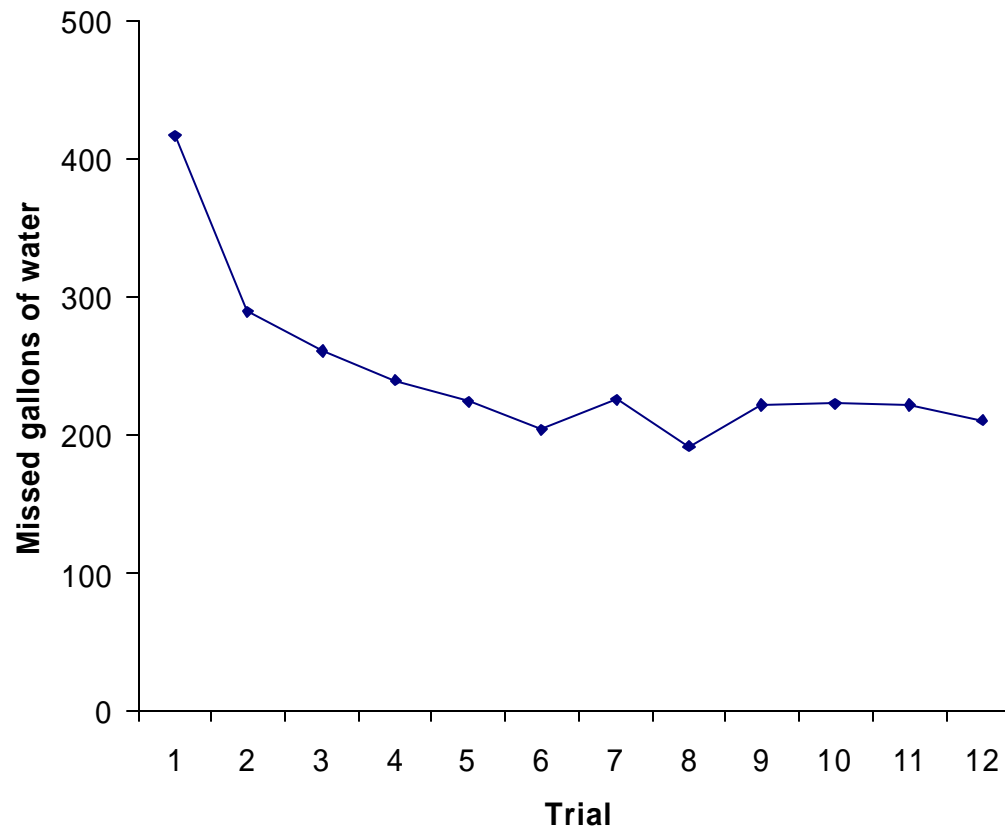
Current Models Assume:

- "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

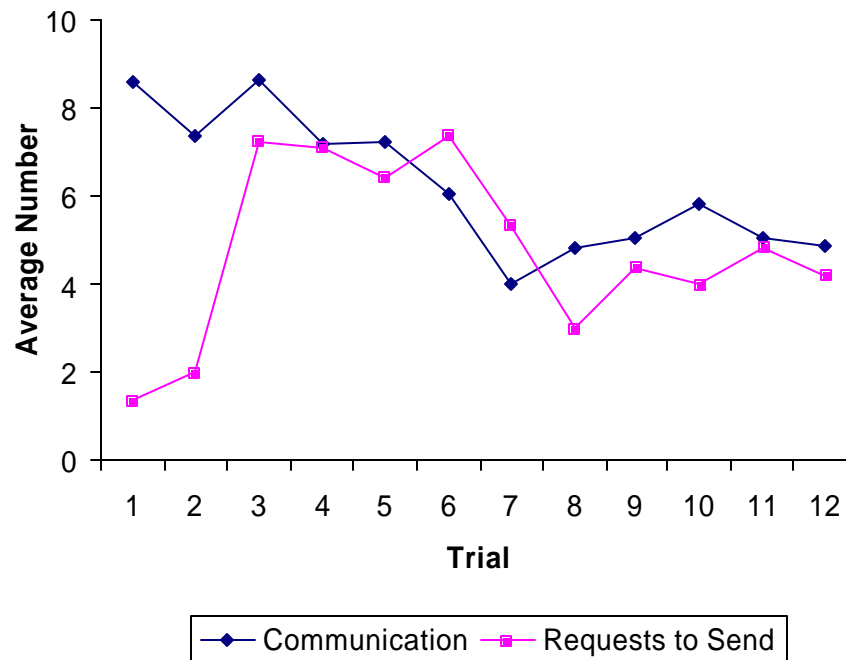
The cognitive Models: Demo



Human Data: team performance



Human Data: coordination



Feedback, References, Ideas

