

Teams Under Stress

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Agenda

- Program of research
- Studying teams under stress - general findings
- Ontario Mine Rescue research project
- Preliminary results

Fundamental Question

Why do some teams consistently outperform similar teams in crisis situations?

- MSci, U. of Colorado at Denver
- PhD, U. of Texas at Austin
- 20+ years of studying teams under stress...



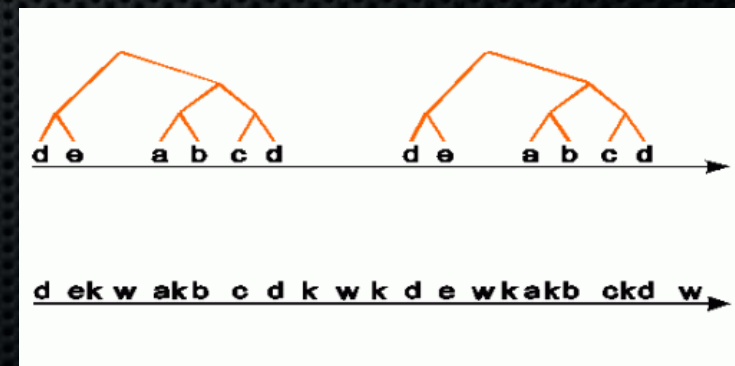
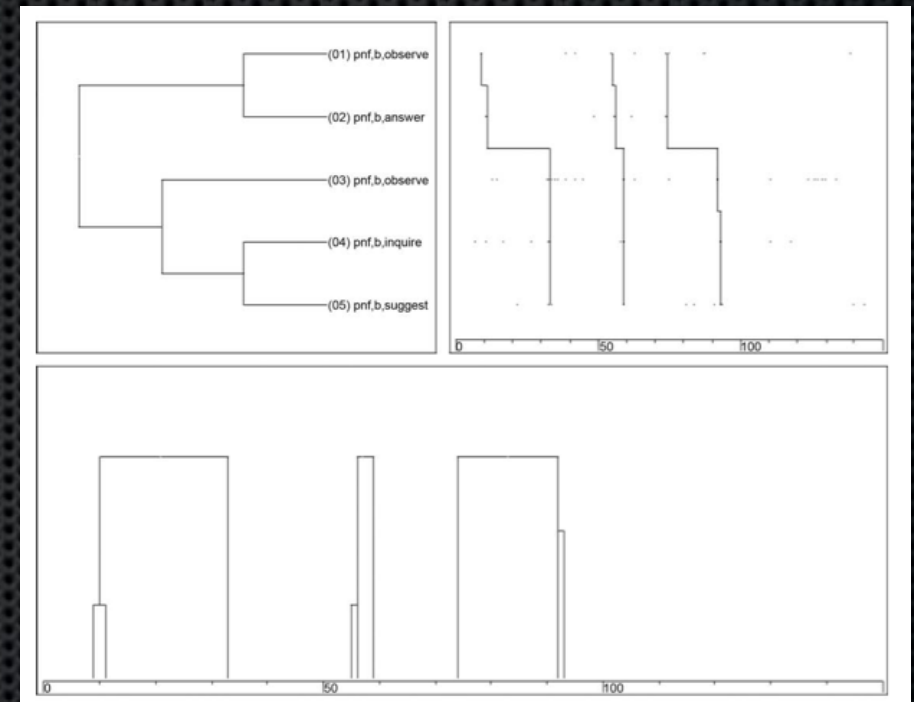
Simulations



- Realistic
- Consequential
- Crisis events
- Performance measures

Data Collection

- Record real teams during simulated crisis events
- Slice recordings into 10-second intervals
- Code presence of key behaviors per interval
- Use statistical models to see what high performers do differently from low performers, and when



Airline Flight Crews



- Analysis two-person crews in simulator
- **First 15 minutes of interaction predicted entire flight performance**
- All teams do a briefing; **high performers set the tone with positive, reciprocal communication.**

Medical Trauma Teams



- 48 trauma teams at Children's National Medical Center, Washington, D.C.
- **All teams knew the right protocols; high performers consistently involve everyone in complex decision making.**

Nuclear Power Plant Crews

- Two plants in the US
- All working under same rules, training, regulations
- **All teams know to get on the same page; high performers also remember to turn the page and collectively update their mental models.**



Managing Teams Under Stress

Set the

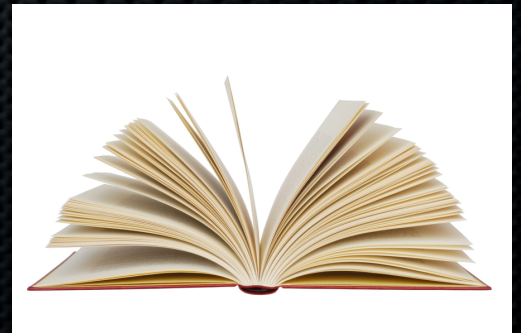


early



Constant reciprocal interaction

Get on the same page, and turn it



Ontario Mine Rescue



- Grant from Social Science & Humanities Research Council of Canada (SSHRC)
- Three-year study (2012-2014) of mine rescue teams during competition simulations
- Dr. Mary Waller and Dr. Seth Kaplan (George Mason U.)
- Sponsored by **Ontario Mine Rescue and Workplace Safety North**





Research Focus

- Mine rescue teams encounter a wide variety of non-routine events -- first aid, rescue, equipment use, fire fighting -- under extreme conditions
- Mine rescue teams must quickly vacillate between situation assessment and choosing/applying protocols
- *What patterns of interaction separate excellent from good mine rescue teams?*

Data Collection



| DATANAME | TIME | EVENT |
|----------|------|--------------|
| C1 | 260 | : |
| C1 | 260 | TA,b,NE |
| C1 | 313 | US,b,BegProc |
| C1 | 425 | US,b,DE |
| C1 | 434 | US,b,DE |
| C1 | 487 | LO,b,PI |
| C1 | 516 | RO,b,PI |
| C1 | 644 | LO,b,PI |
| C1 | 644 | US,b,BegFB |
| C1 | 651 | US,b,SumRec |
| C1 | 735 | LO,b,DE |
| C1 | 773 | LO,b,Pacing |
| C1 | 773 | RO,b,PI |
| C1 | 847 | RO,b,Warning |
| C1 | 847 | RO,b,Pacing |
| C1 | 847 | US,b,Warning |
| C1 | 848 | US,b,Pacing |
| C1 | 866 | RO,b,PI |
| C1 | 874 | US,b,FBText |

Behavioral Coding
Scenario Script

QUESTIONNAIRE

Very often ☐

Often ☐

Sometimes ☒

Rarely ☐



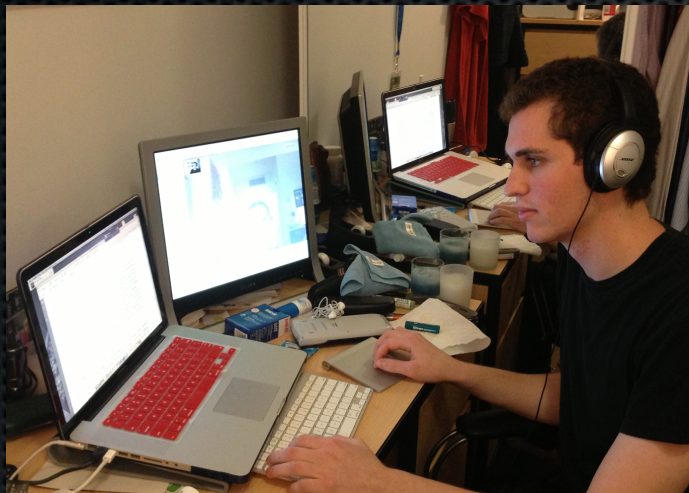
Competition
Audio

Individual Performance,
Consent Forms



Expert Performance Ratings

Current Work



- Using **scripts** and **scribe notes** to determine timing of specific events (fire fighting, first aid, etc.)
- Locating and syncing event audio per team
- Using performance ratings per event
- Three teams completed so far...

Preliminary Results



- Based on data collected at 2012 OMR Provincial Competition
- **Excellent** performing teams seem to:
 - engage in **full-team briefing** communication more often and more quickly
 - **push more information** for implicit coordination
 - exhibit **shorter, less complex** interaction patterns during protocol application
 - exhibit **longer, more complex** interaction patterns during situation assessment

Next Steps



- Complete data collection for 2014
- Code and analyze data from all 33 teams (21 provincial, 12 district)
- Include specific analyses for captain, vice-captain, briefing officer interactions
- Present and publish final results
- **Design next Mine Rescue study!**

Thanks!

Questions?

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