

Linköpings universitet

# Predicting Group Faultlines in Multinational C2 Operations

**Ida Lindgren** ([ida.lindgren@liu.se](mailto:ida.lindgren@liu.se))

**Kip Smith** ([kip.smith@liu.se](mailto:kip.smith@liu.se))

**Rego Granlund** ([rego.granlund@c3fire.org](mailto:rego.granlund@c3fire.org))

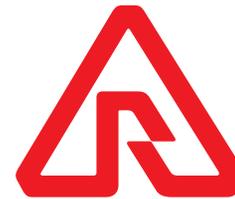
Department of Management and Engineering  
Linköping University, Sweden

# Acknowledgements



Linköpings universitet

- This research was funded by the Swedish Rescue Services Agency (SRSA),



RÄDDNINGSS  
VERKET

- and was conducted in cooperation with Skövde University.



# Outline



Linköpings universitet

- Research question and the domain of study
- OSOCC, culture, diversity, and group faultlines
- Empirical evidence of the utility of the concept of cross-cultural group faultlines
- Implications for multinational operations and training

# Research question



Linköpings universitet

- Does the group faultline concept provide a viable vocabulary for assessing, describing and explaining the impact of cultural and demographic diversity in multinational command and control teams?
  - OSOCC
  - Culture
  - Diversity
  - Group faultlines

# Onsite Operations Coordination Centers (OSOCC)



Linköpings universitet



- Used by the UN, the EU Commission, and NATO/PfP.
- The OSOCC team is formed ad-hoc and on-site.

- Culture is studied by many scientific fields.
  - We take our inspiration from cross-cultural psychology.
- What is culture?
  - Culture is a relatively organized system of shared meanings (Smith and Bond, 1999, p. 39).
  - Culture is passed from one generation to the next, sustained by social relations within highly specific contexts.
  - Our cultural heritage largely defines our values - how we prefer to lead our lives.

# Team diversity



Linköpings universitet

- *Team diversity* typically refers to the degree to which members of a team have different demographic attributes:
  - gender,
  - nationality,
  - ethnicity,
  - profession,
  - educational background
  - etc.

# The impact of diversity



Linköpings universitet

- The research on diversity in work groups has generated inconsistent results.
- Diversity is BENEFICIAL:
  - It fosters creativity, affinity, avoids group-think ...
- Diversity is DETRIMENTAL:
  - It impedes communication and commitment, ...

# Group faultlines



Linköpings universitet

- A unifying construct that explains and predicts the antithetical consequences of demographic diversity in the workplace.

Lau and Murnighan (1998)

*Academy of Management Review*, 23 (2), 325-340.

- We have extended its scope to include cross-cultural sources of diversity.

Lindgren, Smith and Granlund (in review)

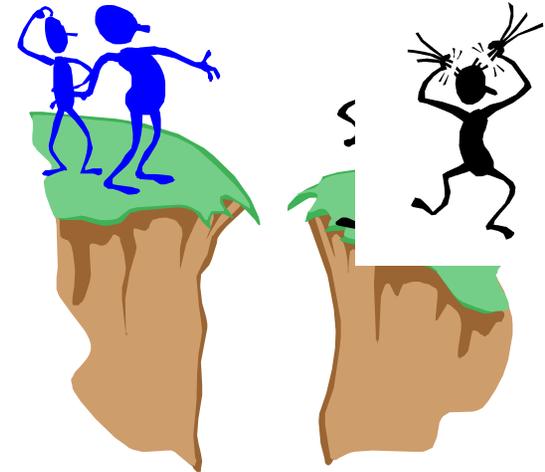
Organizational Behavior and Human Decision Processes

# Group faultlines



Linköpings universitet

- Hypothetical dividing lines that may split a group into subgroups based on several attributes simultaneously.
  - e.g., Gender + Nationality



# Faultline 'strength'



Linköpings universitet

- Faultline 'strength' is function of the coherence of subgroups on either side of the fault.
- Two factors influence subgroup coherence:
  - the number of attributes apparent to group members, and
  - their alignment into homogeneous subgroups.
- e.g., Profession

*(Lau and Murnighan, 1998; 2005)*

# Faultline 'strength'



Linköpings universitet

- Faultline 'strength' is function of the coherence of subgroups on either side of the fault.
- Two factors influence subgroup coherence:
  - the number of attributes apparent to group members, and
  - their alignment into homogeneous subgroups.
- e.g., Profession + Gender

*(Lau and Murnighan, 1998; 2005)*

# Faultline 'strength'



Linköpings universitet

- Faultline 'strength' is function of the coherence of subgroups on either side of the fault.
- Two factors influence subgroup coherence:
  - the number of attributes apparent to group members, and
  - their alignment into homogeneous subgroups.
- e.g., Profession + Gender + Age

*(Lau and Murnighan, 1998; 2005)*

# Strong faultlines

# Weak faultlines



Linköpings universitet

- Faultlines are strongest when several attributes align and split the team into two clear subgroups.

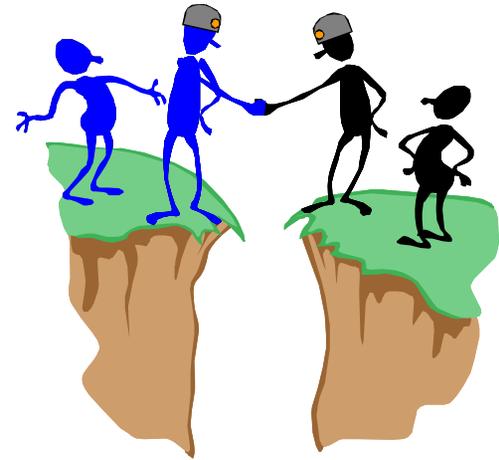
# Strong faultlines

## Weak faultlines



Linköpings universitet

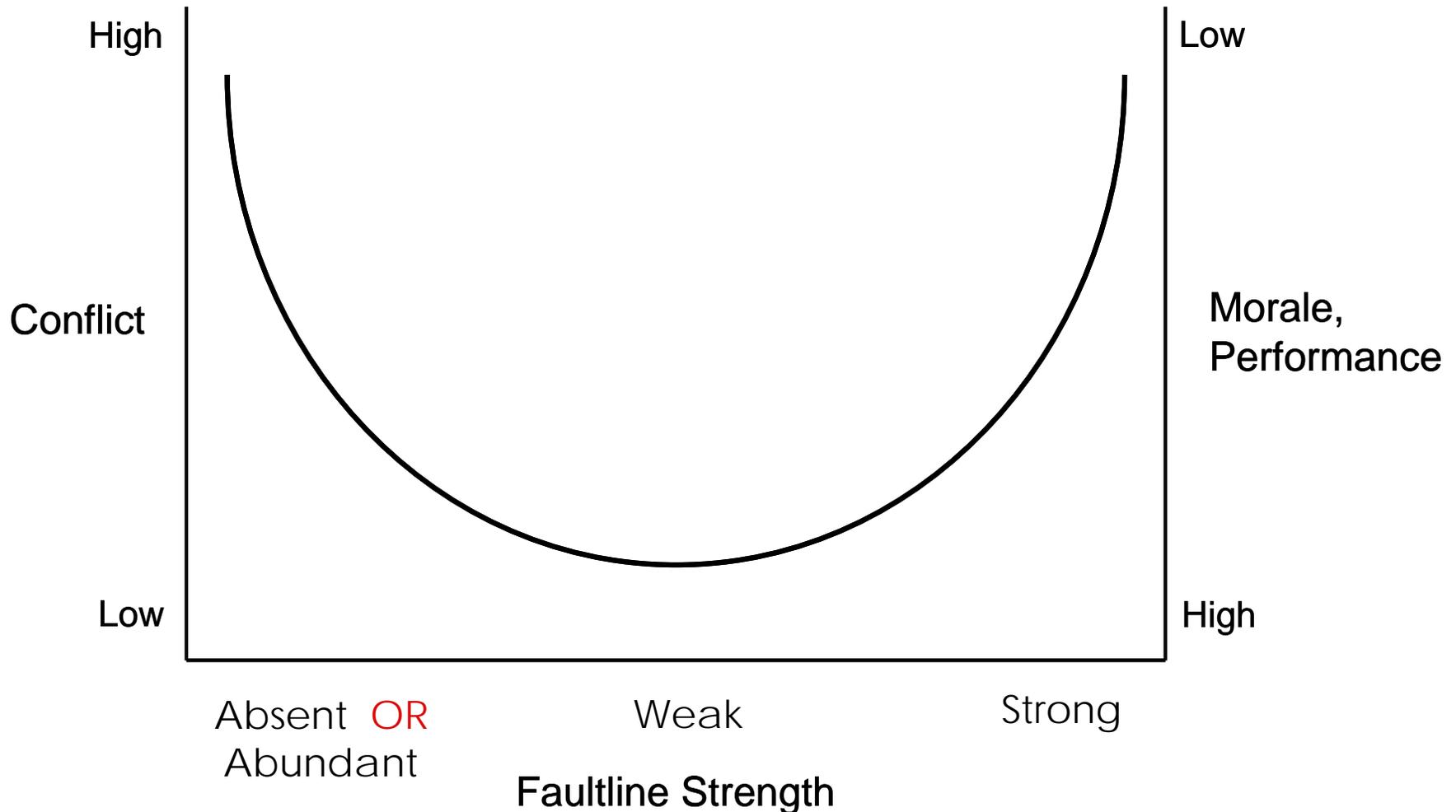
- Faultlines are strongest when several attributes align and split the team into two clear subgroups.
- Faultlines are weakest when there are several alternative alignments and multiple subgroups can form.
  - Boundary spanning



# Faultline strength and performance



Linköpings universitet



*after Thatcher, Jehn and Zanutto (2003)*

# Examples of diversity and faultlines



<b>Group 1</b>	Student Man 20 Swede	Student Man 20 Swede	Student Man 20 Swede	Student Man 20 Swede	<i>No diversity.</i> <i>No faultline.</i>	
<b>Group 2</b>	Student Man 20 Iranian	Student Man 20 Swede	Student Woman 20 Swede	Student Woman 20 Iranian	<i>Low diversity.</i> <i>Weak faultlines.</i>	
<b>Group 3</b>	Teacher Man 50 Swede	Teacher Man 55 Swede	Student Woman 20 Iranian	Student Woman 20 Iranian	<i>Moderate diversity.</i> <i>Strong faultline.</i>	
<b>Group 4</b>	Student Woman 20 Swede	Teacher Man 30 Bosnian	Nurse Woman 65 Iranian	Fireman Man 50 Indian	<i>High diversity.</i> <i>Abundant faultlines.</i>	

# Our research builds upon the faultline model



Linköpings universitet

- Previous applications of the faultline model have looked at (only) demographic characteristics.
- We extend the faultline model to cultural norms for decision making and to correlations with value types.
- We have identified patterns of cultural similarity and diversity that have the potential to form faultlines.



Linköpings universitet

# Empirical evidence for the utility of the concept of cultural faultlines

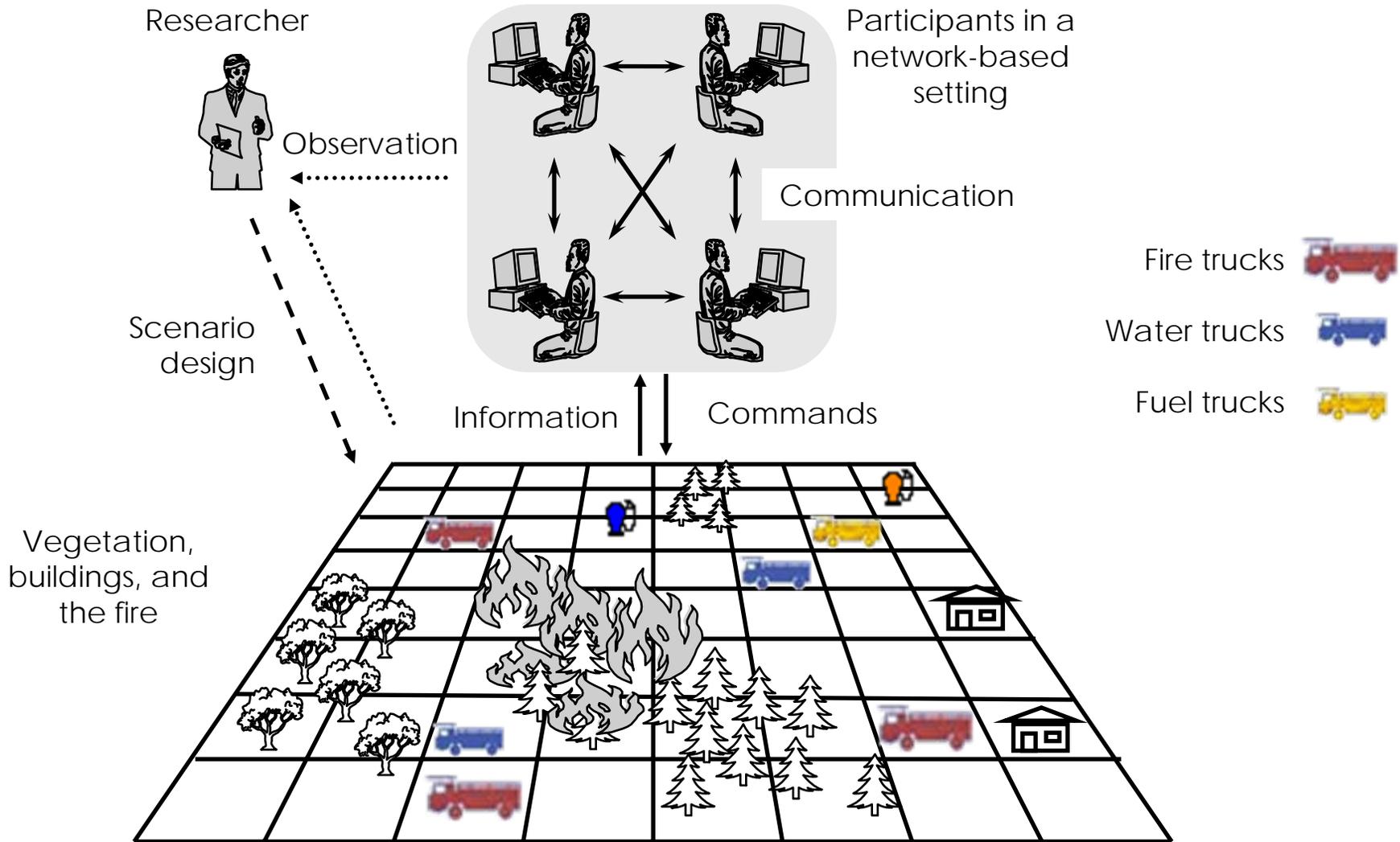
How we elicit cultural differences in decision making using a laboratory simulation of an emergency management task

# Our method for studying cultural norms for teamwork



Linköpings universitet

- We used the C<sup>3</sup>Fire microworld (Granlund, 2002) to study cultural norms for communication, decision making, and cooperation.
- A microworld is
  - A small, tightly constrained system that retains the important characteristics of the real world system:
    - Dynamics
    - Complexities
    - Interdependencies
  - Controllable



# The Players' Tasks



Linköpings universitet

- Manage multiple and potentially conflicting goals
- Allocate responsibilities
- Develop a strategy for fighting the fire
- Take actions that implement the strategy
- Communicate and cooperate

# Culturally homogeneous groups of participants



Linköpings universitet

<b>Nationality</b>	<b>Groups</b>	<b>Number of participants</b>	<b>Number of sessions for analysis</b>
Protestant Europeans (PE)	4	32	64
Muslim Europeans (ME)	3	22	46
Hindi Asians (HA)	4	30	62
Muslim Asians (MA)	4	30	62
<b>TOTAL</b>	<b>15</b>	<b>114</b>	<b>234</b>

# Data capture



Linköpings universitet

- Communication (Email)
- Commands to trucks
- Firefighting
  - Truck movement
  - Fire suppression
  - Clusters of activity
- Questionnaire data

Cultural norms for communication, decision making, and cooperation.

We found 30 dimensions of cultural diversity: Sources of faultlines.

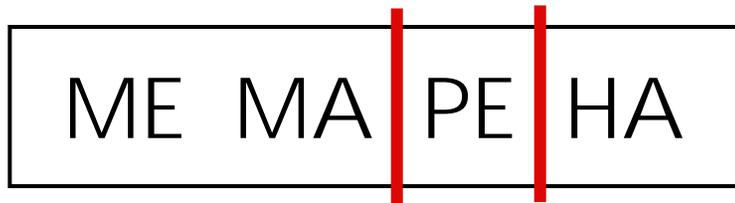
*Lindgren & Smith, 2006; Lindgren, 2007; Smith, Lindgren and Granlund, 2007*

# Faultline dimensions

## – a sample



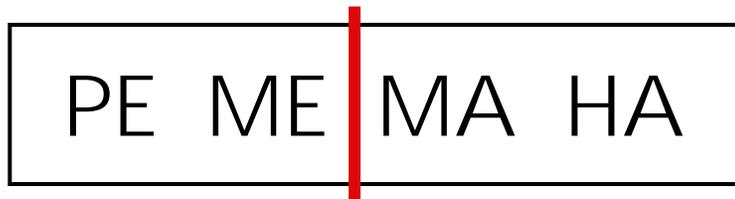
Linköpings universitet



Goal formation



Value type ranking;  
Feedback type



Feedback frequency

# Goal formation



Linköpings universitet

- The instructions to subjects did not provide any priorities or specify the goal.
- The teams were given the same set of potentially conflicting goals:
  - Suppress the fire or save the buildings?
- Each team had to define its goal and work together to reach it.

# Goal formation - Findings



Linköpings universitet

- The teams set three different goals:
  - Teams from both Islamic nations (ME and MA) tried to contain the fire to areas without dwellings or fast-burning trees.
  - Every team from the PE nation attacked the fire directly.
  - Every team from the HA nation protected the dwellings.

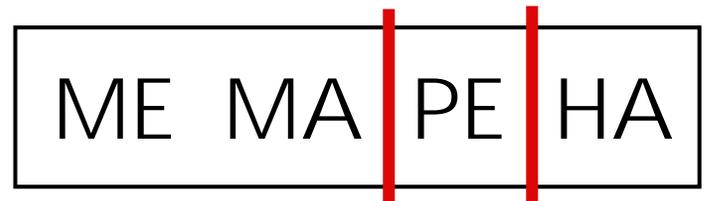


# Goal formation - Implications



Linköpings universitet

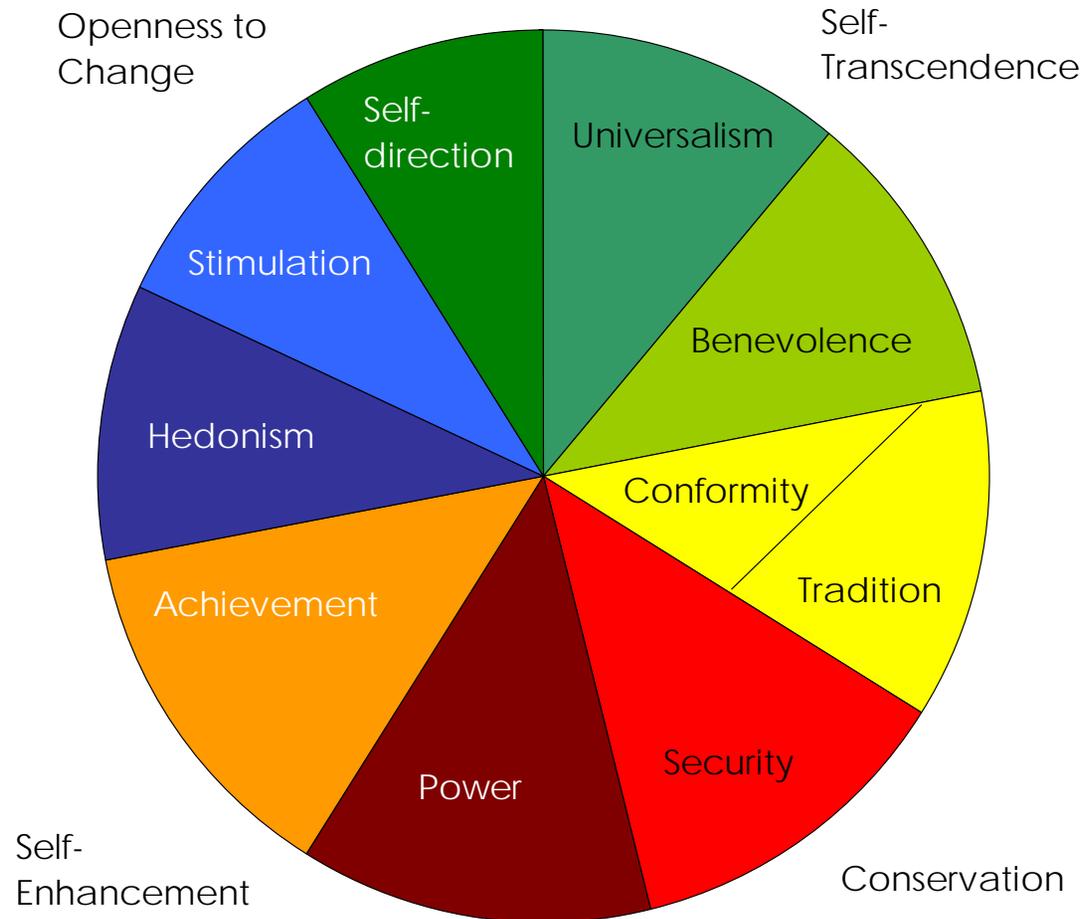
- There can be distinct cultural differences in the criteria use to establish a team's goals.
- Instructors of multinational teams need to stress that the team must set explicit goals and get everyone on the team to agree on those goals prior to committing to a course of action.



# Schwartz's configural model of Value Types



Linköpings universitet



(Schwartz, 1992; 1994)

# Values and Value Types



Linköpings universitet

## The ten value types

Universalism

Benevolence

Conformity

Tradition

Security

Power

Achievement

Hedonism

Stimulation

**Self-direction**

Several different values are associated with each value type.

## Self-direction

Creativity

Curiosity

Freedom

Choosing own goals

Independence

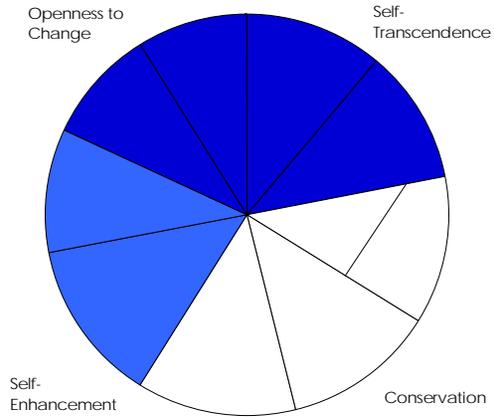
(Schwartz, 1992; 1994)

# Value type ranking

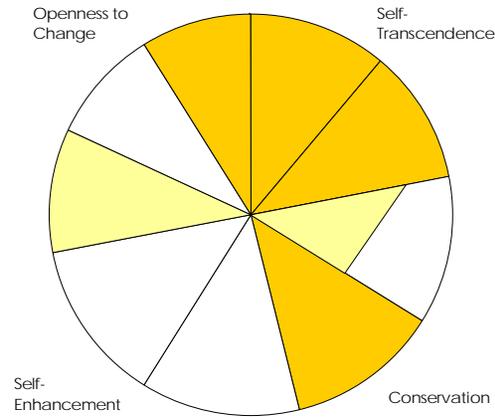


Linköpings universitet

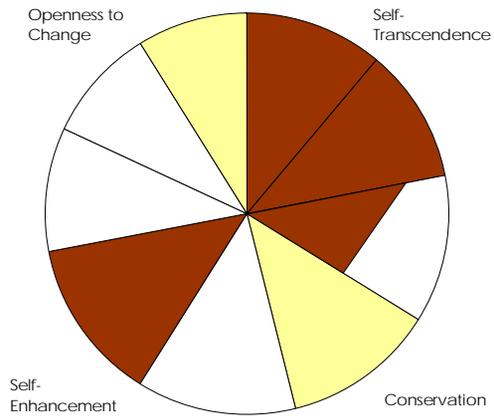
**PE**



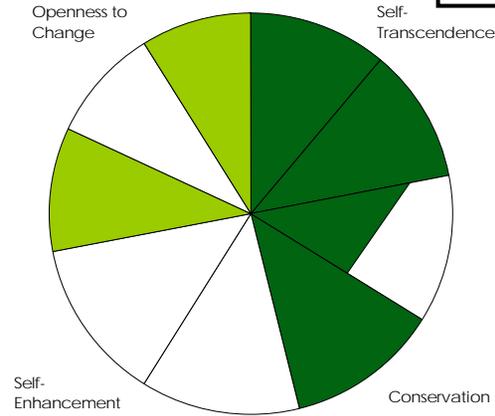
**ME**



**HA**



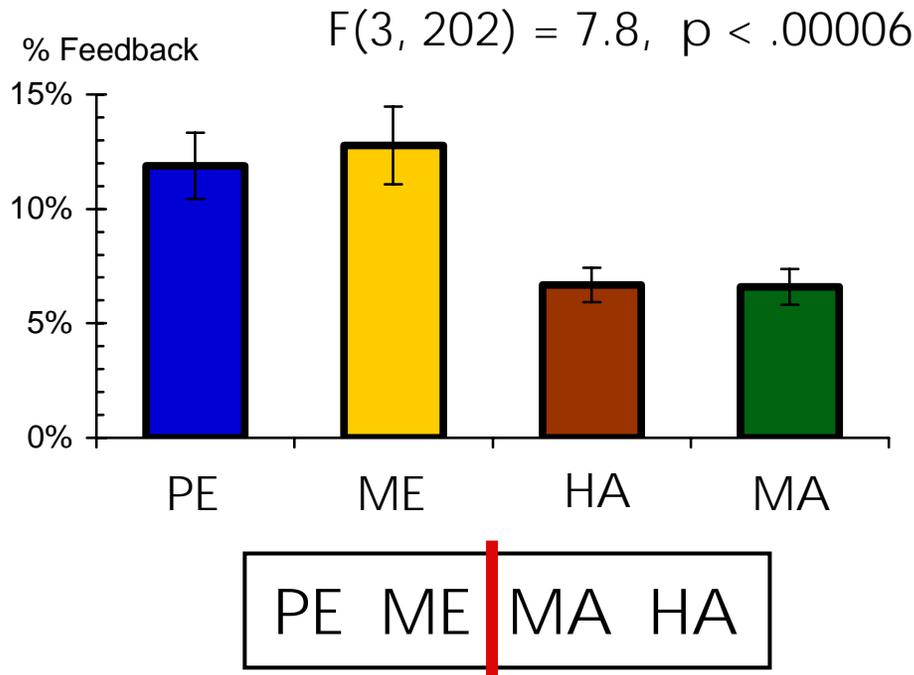
**MA**



# Feedback



- Members of teams from the two European groups sent each other feedback much more frequently than did members of the two groups from Asia.

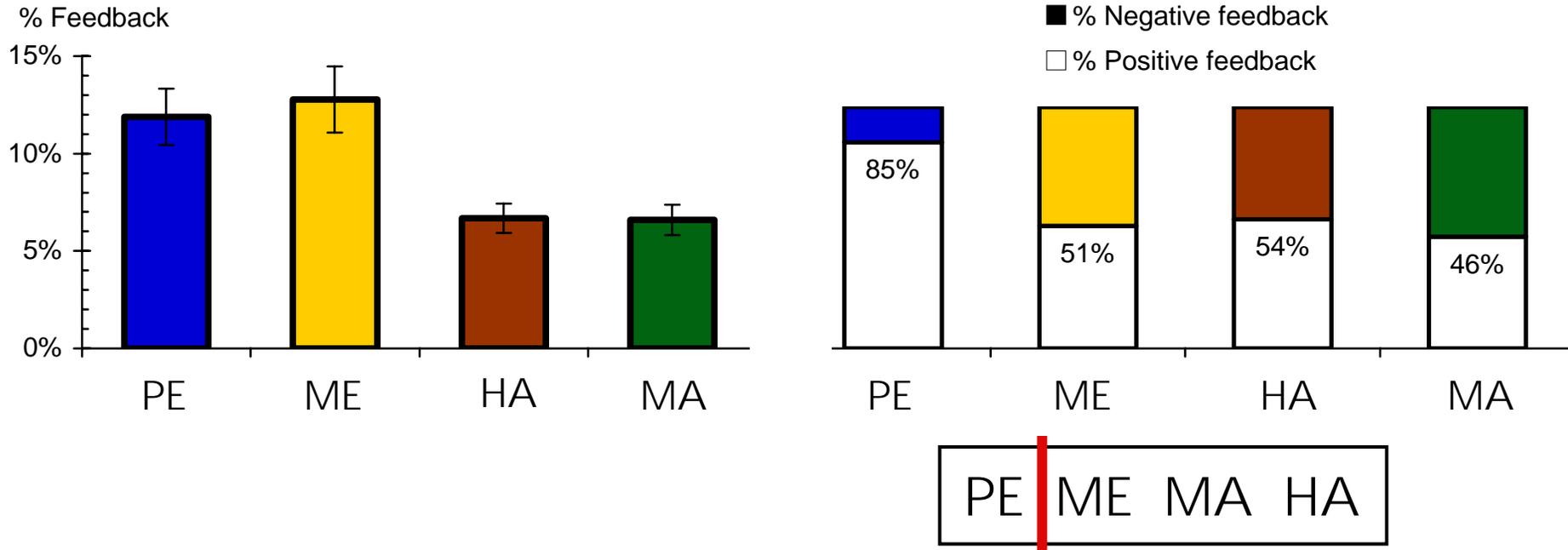


# + / - Feedback



- Members of Protestant European teams tended to avoid negative feedback. The other three groups were comfortable with negative feedback.

$F(3, 202) = 7.3, p < .00011$

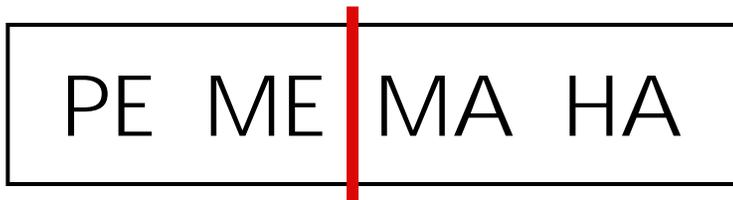


# Feedback - Implications



Linköpings universitet

- These national groups exhibited profoundly different norms for the appropriateness of feedback.
- The danger here is that it would be easy to contravene another culture's norms simply by acting naturally.





Linköpings universitet

# Implications for multinational operations

# Application to training



Linköpings universitet

- Faultlines provide an intuitively compelling vocabulary for discussing culturally-driven diversity and conflict.
- Team design prior to a course / training program
  - Strong faultline -- training to deal with cultural barriers
  - Weak faultlines -- training for tasks, roles, etc.

# Team design



Linköpings universitet

- Knowledge of the dimensions, either demographic or cultural, along which faultlines might rift could be a powerful pedagogical tool if used strategically.
- Instructors who know how dimensions of cultural diversity can align and produce faultlines can apply this knowledge when assigning personnel to a multinational team and to its tasks.

# Overlapping characteristics are good



Linköpings universitet

- When sources of diversity overlap, there are people who belong to several subgroups.

Fireman	Fireman	Physician	Physician	Physician
Man	Man	Woman	Woman	Man
31	53	55	52	50
Swede	Swede	Swede	Bosnian	Bosnian

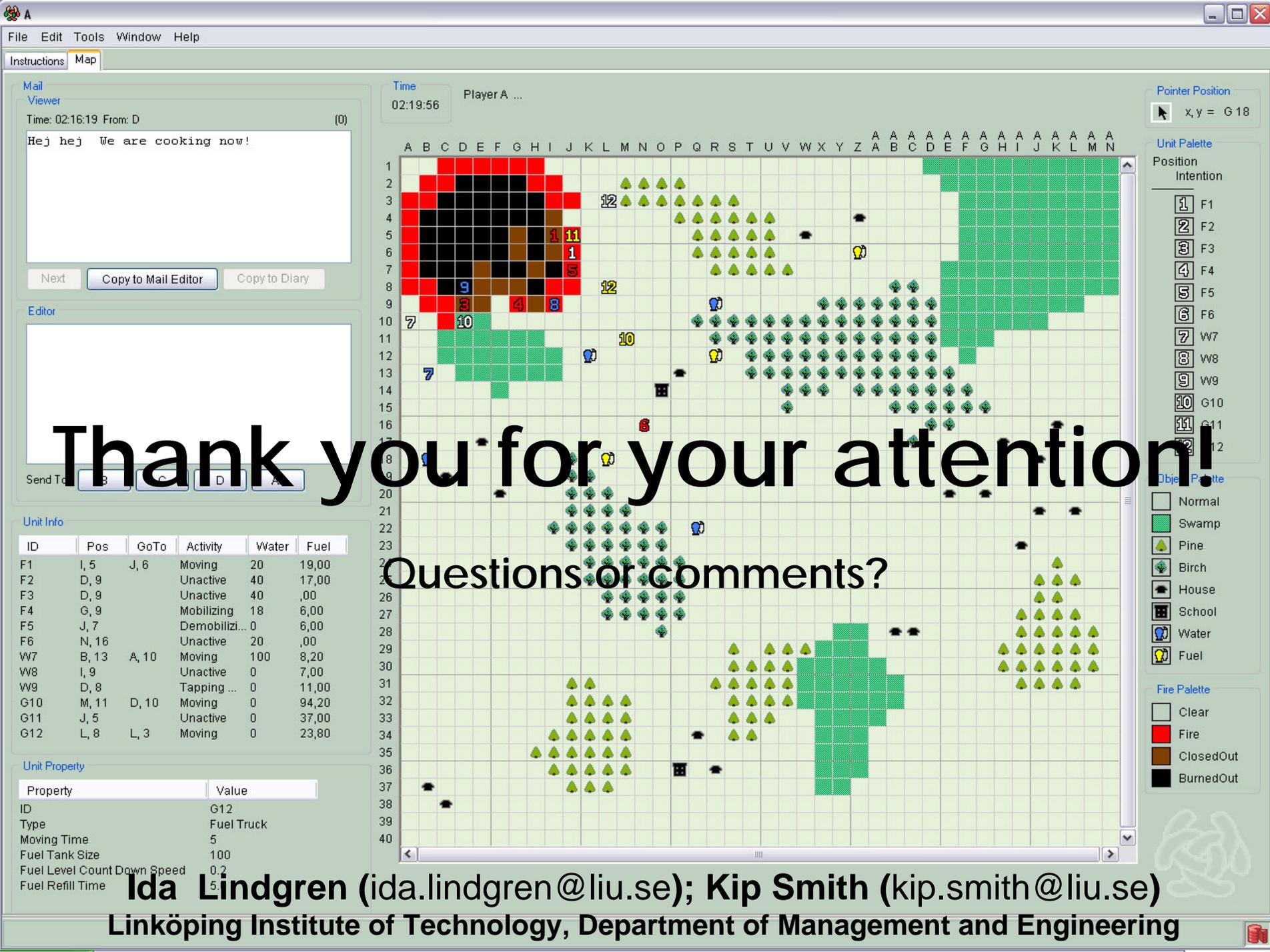
Moderate diversity

Weak faultlines



- By bridging the faultline, they can promote communication across subgroups and benefit the team.

- In summary, we are convinced that the group faultline concept has the potential to become a influential pedagogical tool for training multicultural teams.
- The potential of the faultline concept can be realized by continuing this line of empirical research,
  - by interviewing people returning from international C2 training and operations, and
  - by conducting observations of multinational training sessions.



Thank you for your attention!

Questions or comments?

ID	Pos	GoTo	Activity	Water	Fuel
F1	I, 5	J, 6	Moving	20	19,00
F2	D, 9		Unactive	40	17,00
F3	D, 9		Unactive	40	,00
F4	G, 9		Mobilizing	18	6,00
F5	J, 7		Demobilizi...	0	6,00
F6	N, 16		Unactive	20	,00
W7	B, 13	A, 10	Moving	100	8,20
W8	I, 9		Unactive	0	7,00
W9	D, 8		Tapping ...	0	11,00
G10	M, 11	D, 10	Moving	0	94,20
G11	J, 5		Unactive	0	37,00
G12	L, 8	L, 3	Moving	0	23,80

Property	Value
ID	G12
Type	Fuel Truck
Moving Time	5
Fuel Tank Size	100
Fuel Level Count Down Speed	0.2
Fuel Refill Time	5

Ida Lindgren (ida.lindgren@liu.se); Kip Smith (kip.smith@liu.se)  
Linköping Institute of Technology, Department of Management and Engineering