Evaluating Safety Climate to Manage EHS Risk

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Evaluating Safety Climate to Manage EHS Risk

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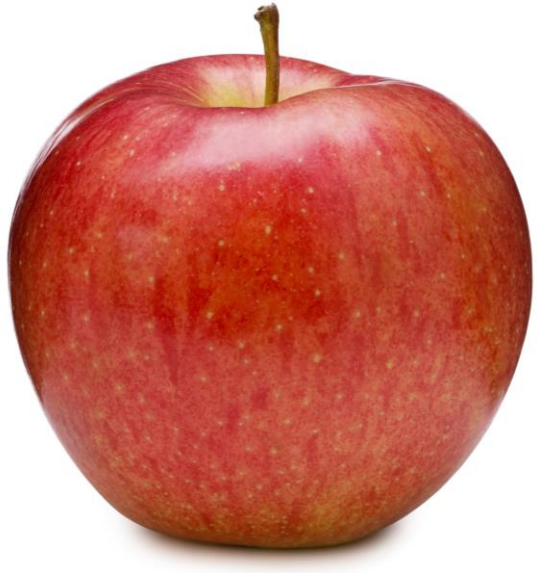
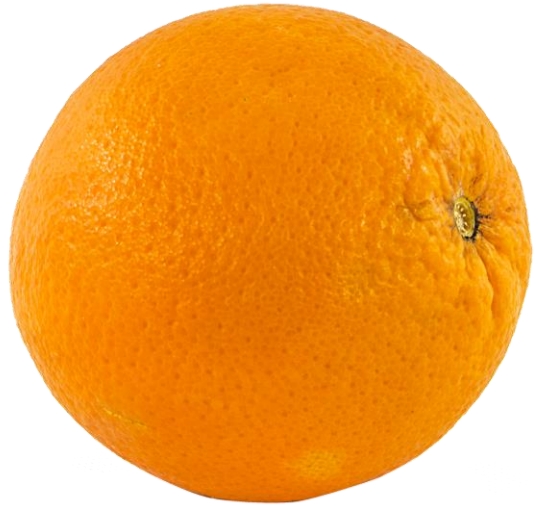
Overview

- Organizational culture and climate
- Safety climate
- Factors that influence safety climate
- Safety climate survey examples
- Application to risk management



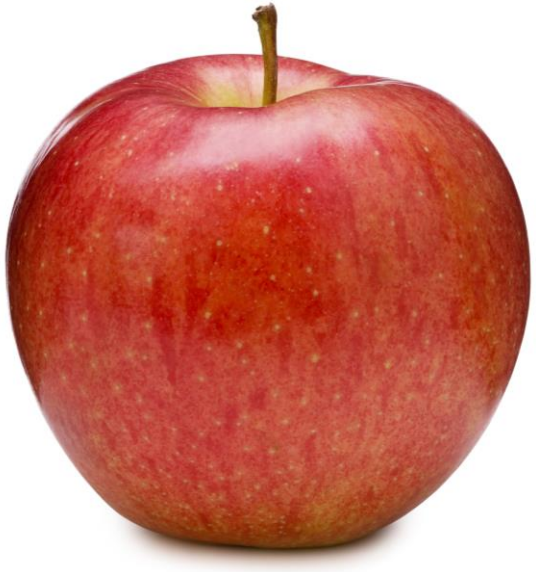
Organizational Culture

Shared basic assumptions, values, and beliefs that characterize a setting and are **taught** to newcomers as the proper way to think and feel



Organizational Climate

Shared **perceptions** of and the meaning attached to the policies, procedures, and practices employees experience and the behaviors they observe



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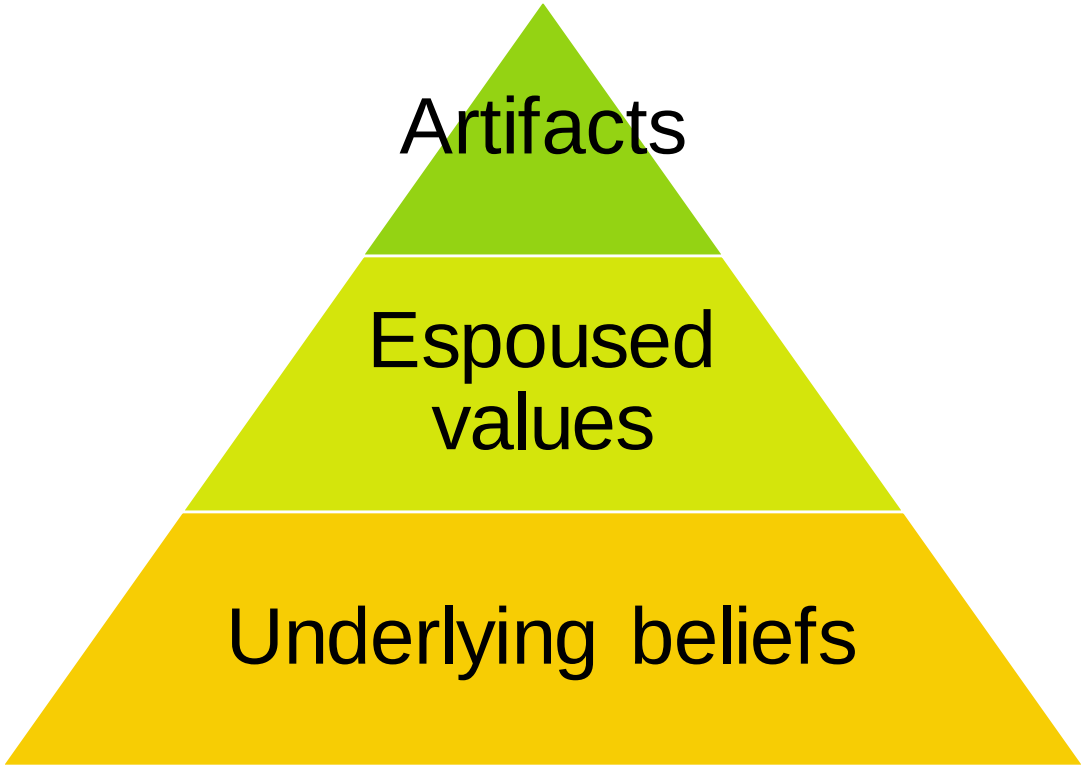
Edgar Schein's model of organizational culture



- Artifacts – easily viewed, heard, and felt, like facility layout and dress code
- Espoused values – what the organization says about itself, like mission and vision statements
- Underlying beliefs – highly integrated beliefs and behaviors held by employees about how they should work and behave

Schneider on organizational climate

Based on perceptions held by employees about aspects of their organizational environment

Perceptions serve as a frame of reference for guiding behaviors and expected outcomes

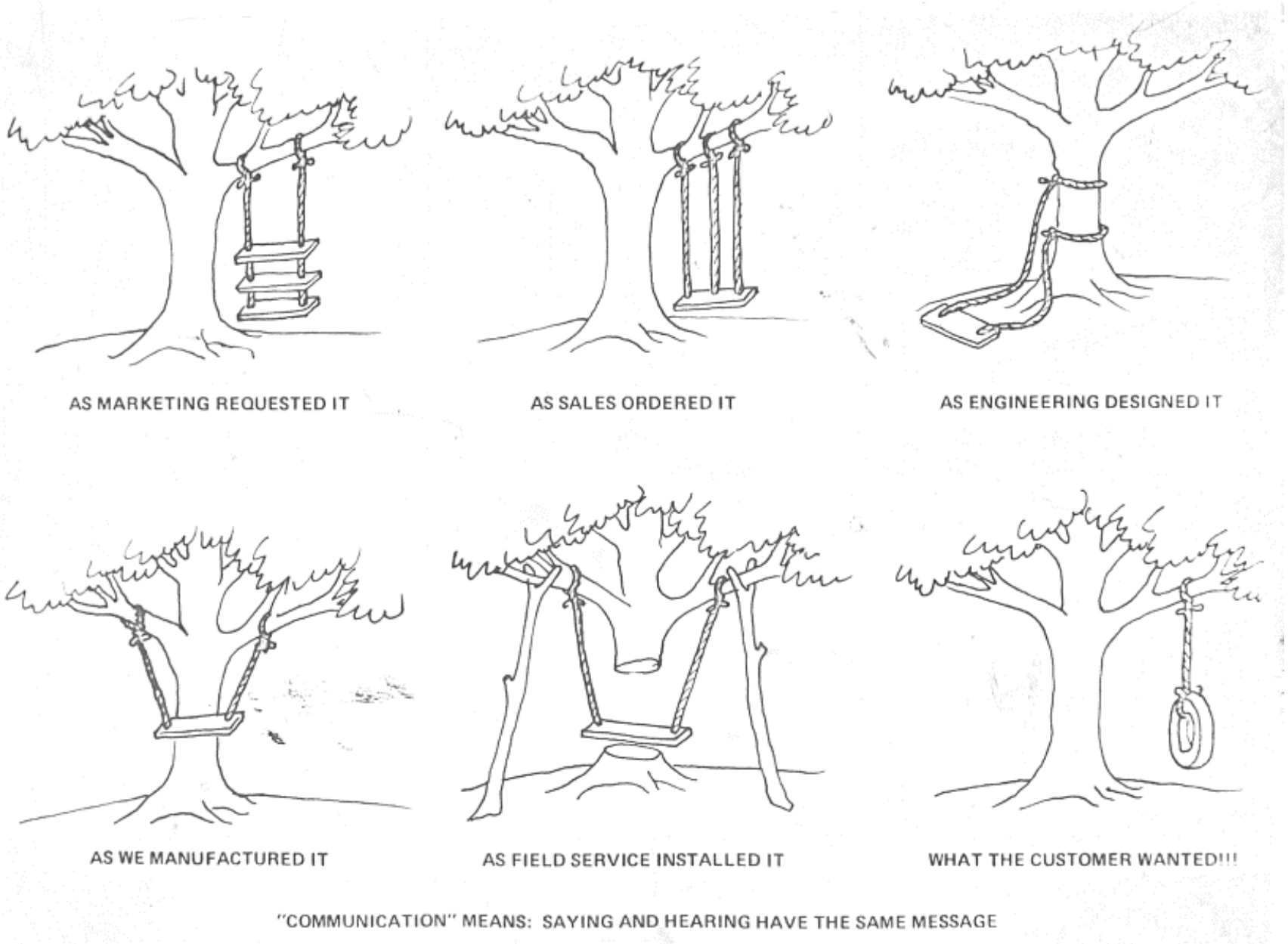
Perceptions

- What activities get rewarded?
- Can be difficult to understand the connection between actions and rewards
- Groups work together to make sense of their individual perceptions
    - Individual and a collective component

Policies, procedures, and practices

- Policies – strategic goals and how they are attained
- Procedures – tactical guidelines to accomplish these goals
- Practices – implementation of policies and procedures

Trouble in Translation…



Translation from top to bottom

Top-levels of organization set goals and direction

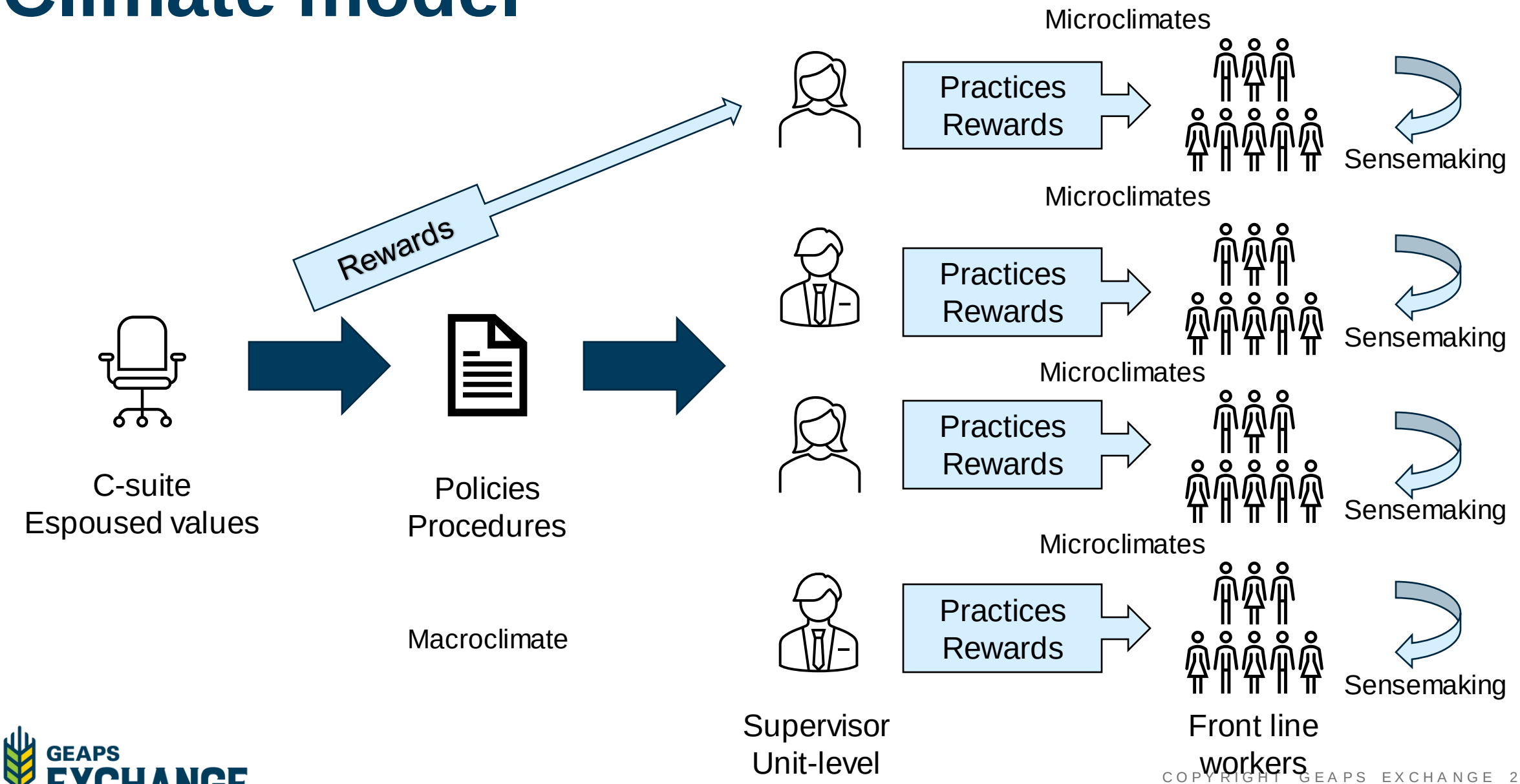
- Policies & procedures to guide the company

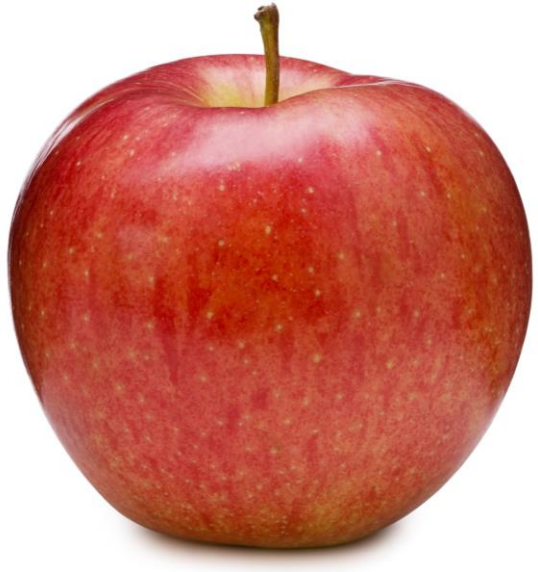
Local managers/supervisors/leaders establish practices

- How work is accomplished in light of policies and procedures
- Local practice can be shaped by many factors, including informal leaders
- Workers make decisions based on what they think will be supported and rewarded

Climate considers the relative priority assigned to different priorities – production, safety, customer service, etc.

Climate model





Safety Culture

Underlying assumptions and values that guide safety behavior in organizations rather than the direct perceptions of individuals

Safety Climate

Surface features of the safety culture discerned from the workforce's attitudes and perceptions at a given point in time – **a snapshot of the current state of safety culture**

Safety Climate

- Shared perceptions among employees regarding what is rewarded, expected, valued, and reinforced in the workplace with respect to safety
- Reflects the extent to which employees perceive that safety is prioritized within the workplace

When push comes to shove, what decisions are made?

Safety climate onion 

Multilevel

- Perceptions concerning safety climate are held across individuals
- Perceptions can be shared across teams, locations, organizations, and industries

Multidimensional (examples)

- Perceptions of management commitment to safety
- Safety systems and procedures
- Training and competence level of co-workers
- Some aspects may be more industry specific

Safety climate research

- First specific study on safety climate published in 1980 by Dov Zohar at the Israel Institute of Technology
- Hundreds of studies completed in various industries
- Survey-based research: often 30-40 questions addressing different themes thought to be relevant to climate, examples:
  - “The safety of workers is a big priority with management.”
  - “My supervisor sometimes encourages unsafe practices.”
  - “Unsafe conditions are promptly corrected in my work area”

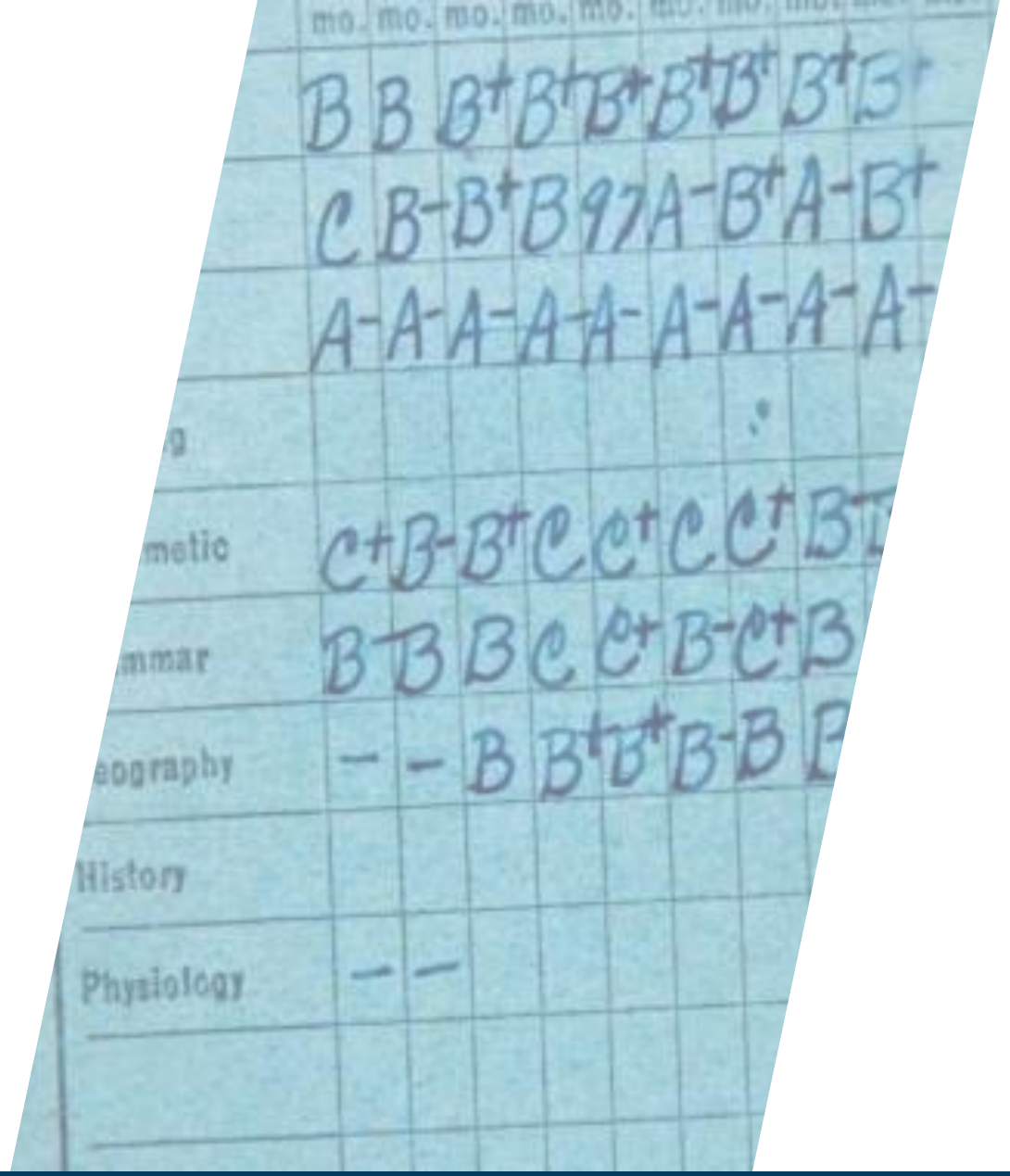
Safety climate as a leading indicator

"Numerous meta-analyses of safety climate have shown that safety climate is predictive of workplace accidents, injuries, underreporting of safety incidents, near misses, safety knowledge, safety motivation, safety compliance, and safety-related organizational citizenship behaviors." *(Probst et. al, 2019)*

Example – CDC / healthcare

	1 – Strongly Disagree	2 - Disagree	3 - Agree	4 – Strongly Agree
1. New employees quickly learn that they are expected to follow good safety practices.				
2. There are no significant compromises or shortcuts taken when worker safety is at stake.				
3. Where I work, employees and management work together to ensure the safest possible working conditions.				
4. Employees are told when they do not follow good safety practices.				
5. The safety of workers is a big priority with management where I work.				
6. I feel free to report safety violations where I work.				

https://www.cdc.gov/nora/councils/hcsa/stopsticks/survey.html



How did you score?

9 – 15 indicates a poor safety climate

16 – 20 indicates a fair safety climate

21 – 24 indicates a good safety climate

Data from 700 nurses in a large Northeastern hospital showed that groups with a “good” safety climate were over 4 times more likely to follow safe work practices than those with “fair” or “poor” climate scores

Benefits of positive safety climate

- Leading indictor of safety performance
- Associated with positive safety behaviors (and fewer injuries)
- More engagement in “voluntary” safety behaviors
- More encouraging of coworker safety behaviors
- Higher retention - increased feelings of commitment to organization and satisfaction
- Associated with positive quality climate

Factors that influence safety climate

Factors that influence safety climate

Study of 722 grain workers in 102 locations in U.S. (Seo et. al, 2004)

1. Management commitment to safety
2. Supervisor safety support
3. Coworker safety support
4. Employee participation in safety-related decision making
5. Competence level of employees with respect to safety

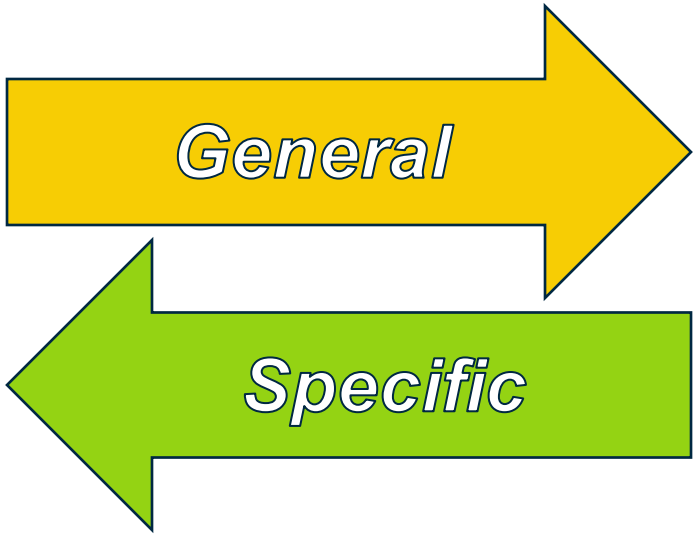
Factors that influence safety climate – cont'd

Study of 2,434 workers from 5 study groups (Beus et. al, 2019)

1. Leader safety commitment
2. Safety communication
3. Safety training
4. Coworker safety practices
5. Safety equipment and housekeeping
6. Safety involvement
7. Safety rewards

General vs. industry specific

- General climate scale
  - Context-free perceptions of climate
  - Not tied to the unique safety and performance issues in an industry
- Industry specific climate scale
  - Placed in the context of the industry
  - Workers, managers, and industry experts help to adapt the survey to reflect specific safety and performance issues
  - The most predictive of safety behaviors



Stephanie Zimmerman, St. Louis Public Radio

Example: safety climate and quality climate – grain workers

Study of 177 grain workers in 3 large Midwest grain facilities (Mosher et. al, 2012)

Investigated the relationship between safety and quality

- Studied climate perceptions at the management and supervisor levels
- In addition to climate survey questions, employees were asked to respond to safety-related and product-quality related scenarios

Findings:

- Positive safety climate was more likely to encourage a positive quality climate
- Employees related the administration of quality more strongly with management team than their supervisors

Seo model of unsafe work behavior (2005)

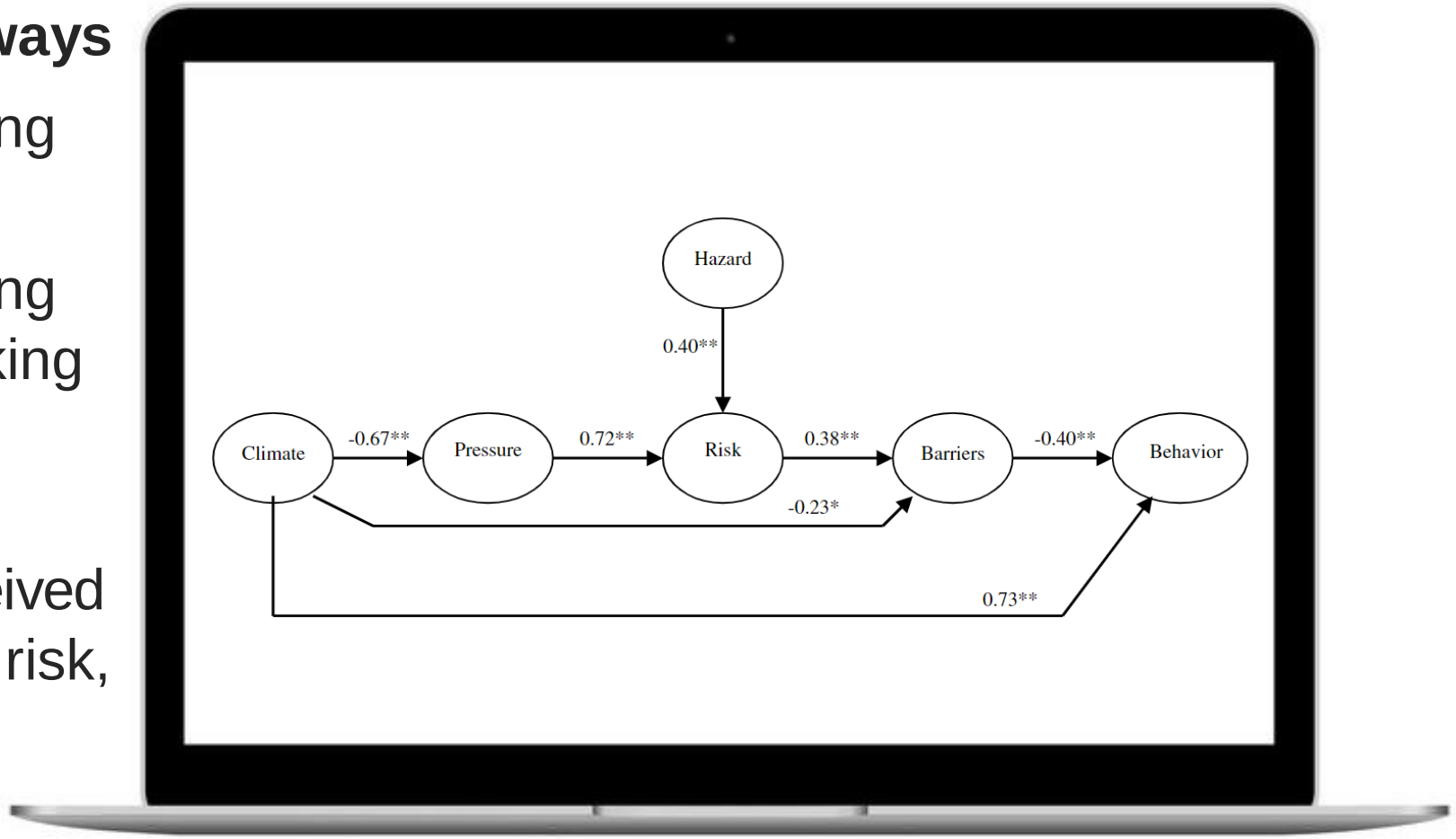
Same dataset of 722 grain workers, using a general climate scale survey

Evaluated five factors and measured their ability to predict unsafe work behaviors

1. Perceived safety climate (most predictive)
2. Perceived hazard level
3. Perceived work pressure
4. Perceived risk
5. Perceived barriers to working safely

Perceived safety climate affected behavior in three ways

1. Direct influence on reducing unsafe behavior
2. Direct influence on reducing perceived barriers to working safely
3. Indirect influence through mediating factors of perceived work pressure, perceived risk, and perceived barriers to working safely



Safety climate survey - two examples

Safety climate evaluation

- Survey questions developed or adapted from a previous study
  - Might include additional questions if a specific area is being evaluated
  - Industry-specific questions are developed as appropriate
- Typically a 5- or 7-point Likert scale used to develop a score
  - Comparison against some general or industry standard
  - Comparison between locations or work groups
  - Comparison at different points in time

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

TAMU cross-industry SC measure

- 30-item and 8-item survey with a 5-point scale

My supervisor is committed to improving safety.
My supervisor places a strong emphasis on workplace safety.
Safety issues are openly discussed between my supervisor and my workgroup.
My supervisor ensures employees have adequate safety training.
My co-workers are committed to safety improvement.
Unsafe conditions are promptly corrected in my work area.
My supervisor encourages employees to become involved in safety matters.
My supervisor praises safe work behavior.

https://safetyclimate.sites.tamu.edu/

Safety Climate Assessment Tool (S-CAT)

- Nice example of an industry-specific assessment tool developed by The Center for Construction Research and Training (CPWR)
- Uses a rubric-based scale (see handout)
- https://scsmis.com/

- Assesses 8 safety climate indicators in construction industry
  - Demonstrating management commitment
  - Aligning and integrating safety as a value
  - Ensuring accountability at all levels
  - Improving supervisory leadership
  - Empowering and involving employees
  - Improving communication
  - Training at all levels
  - Encouraging owner/client involvement

Rubric-based example

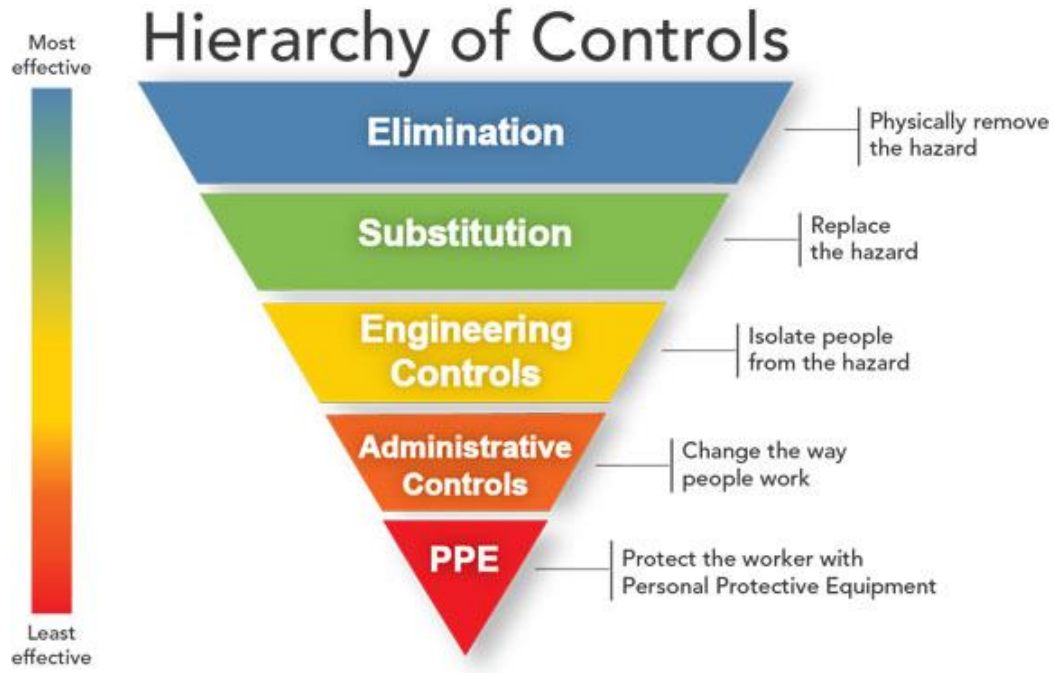
Improving supervisory leadership (S-CAT #4)

Inattentive	Reactive	Compliant	Proactive	Exemplary
1. In my company…				
Supervisors don't have a safety-related vision to share with their crew. Their commitment is primarily to production.	Supervisors don't have a safety-related vision. When an adverse event occurs they tell employees they must work safely.	Supervisory safety vision consists only of meeting regulatory requirements and avoiding adverse safety events.	Supervisors talk with their crew about their vision for creating a strong, positive project safety climate. They display that commitment by "walking the talk."	Supervisors share with their crew their vision for, and display a deep commitment to, creating a strong, positive project safety climate. They inspire and motivate employees to share that same commitment.

Safety climate application to risk management

Risk Management

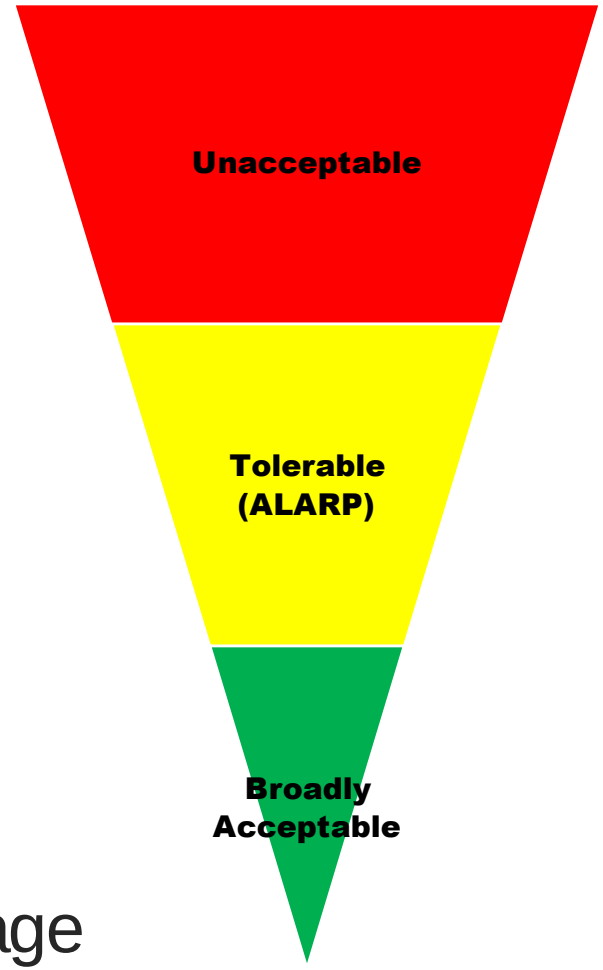
- Risk assessment
  - Identification
  - Analysis
  - Evaluation
- Risk treatment
  - Remove the hazard
  - Limit exposure to the hazard
  - Reduce consequences of exposure
  - Share / retain residual risk



https://www.cdc.gov/niosh/topics/hierarchy/default.html

Considerations

- Risk is a part of life, often tied to opportunity
- Risk must be managed, and should be managed systematically
  - Consequences of hazards are not equal
  - Resources are finite
- Risk management requires us to measure risk and make judgements about the acceptability of risk
  - This may vary depending on who is making the judgement
  - Those who bear the risk should also share in the reward
- Human factors – challenging to understand and manage



Some topics related to human factors

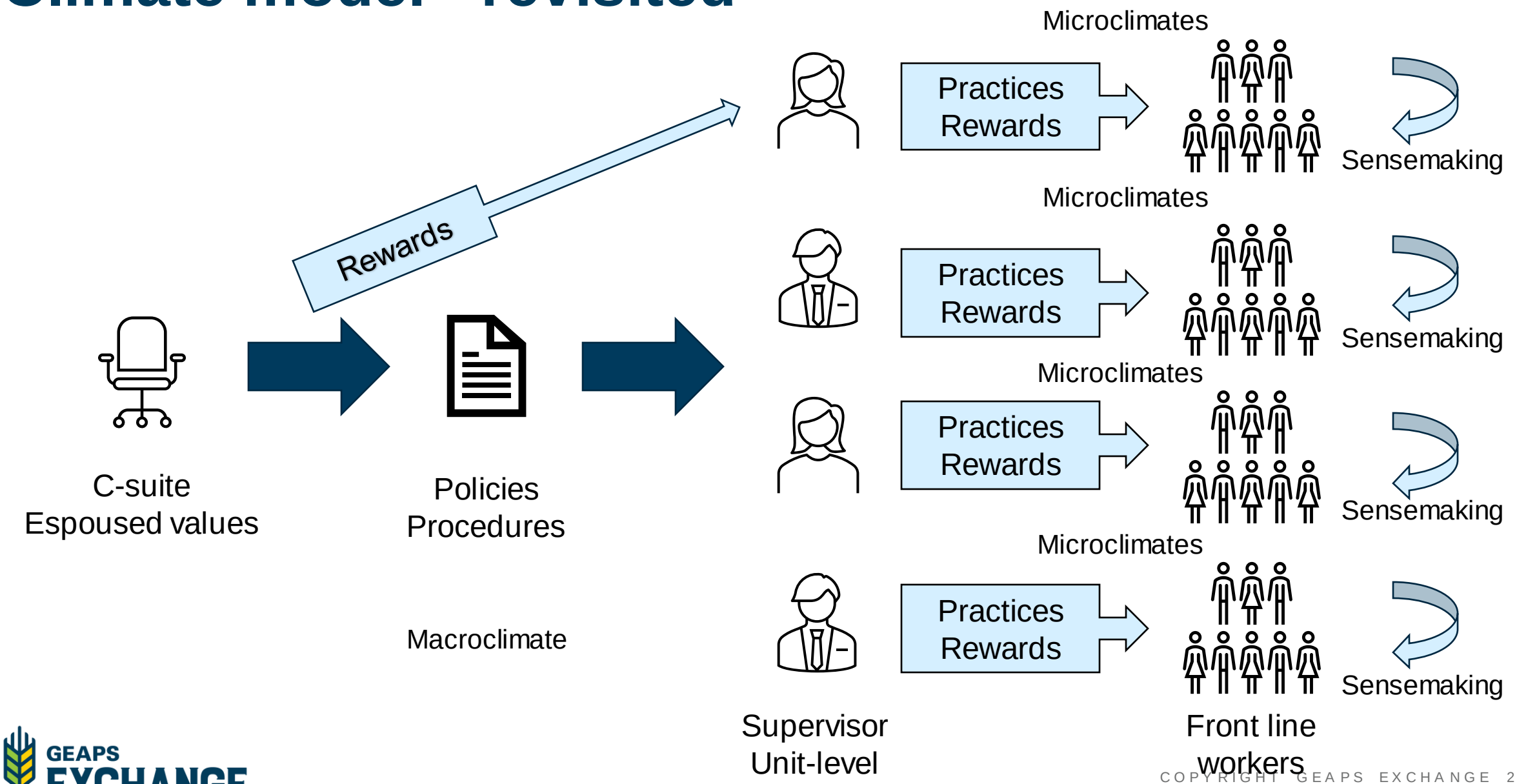
Theory of Planned Behavior (Ajzen, 1985)

- Behavior is related to how individuals make sense of their environment
  - Attitude towards the behavior (is it seen as good or valuable)
  - Social pressures to engage or not engage in the behavior
  - Perception of control (how easy or difficult will it be to engage in behavior)

Health Belief Model (US Public Health Service, 1950s)

- Behavior is related to how individuals perceive risk and the effectiveness of intervention(s)
  - Perception of susceptibility and severity
  - Perception of benefits and barriers
  - Perception of control

Climate model - revisited



Where are the gaps?

Evaluate survey data to identify problem areas

- Disconnect between management, supervisors, work groups
- Specific areas highlighted (accountability, empowerment, training, etc.)

Accident theory – multiple causation

- Unsafe Acts
  - Shortcuts, improper techniques, wrong equipment, etc.
- Unsafe Conditions
  - Poor housekeeping, improper maintenance, no safeguards, etc.
- Contributing Factors
  - Management – commitment to safety, hazard correction, training
  - Worker mental state – distracted, perception of risk, decision making
  - Worker physical state – workload, fatigue, injury

Where are we going?

Take advantage of SC as a leading indicator

- Periodic survey of climate to identify trends
- Survey pre- and post- intervention / training
- Comparisons between locations / departments / shifts
- External benchmarking

Wrap-up…

A few things I'm interested in…

- How do different respirator types influence heat stress in agricultural workers?
- What factors influence worker motivation and behavior concerning respirator use and general safety activities in grain handling facilities?
- How does safety climate impact the use of respiratory protection in grain handling facilities?
- Small scale hops processing and storage

https://accutec.com/respirator-fit-testing/

Discussion

- If you could improve one thing regarding safety at your facility, what would it be?
- Have you used safety climate surveys? What was your experience?
- What benefits can you see in performing a safety climate study at your facility?
- What concerns would you have about participating in a safety climate study?

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