The Interdependence of Safety Climate and Occupational Safety and Health Management Systems

A brief summary connecting safety culture with occupational safety and health management systems in hazardous work environments.

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Four questions (arguments):

1. **How is safety climate perceived or determined in the first place?**

2. **How do we improve safety climate?**

3. **How do we model safety climate in the context of the overall organization of work in a hazardous work environment?**

4. **What are the connections and interactions between safety climate and occupational safety and health management systems (OSHMS)?**

Two definitions:

Safety climate refers to shared perceptions of employees about the safety of their work environment, **and provides a background against which day-to-day tasks are performed. These shared perceptions derive from several factors, including management decision making, organizational safety norms and expectations, and safety practices, policies, and procedures which together serve to communicate organizational commitment to safety. (Hahn and Murphy, 2008, pp.1047-1048; *emphasis added*).**

Organizational climate is made up of *shared perceptions among employees* concerning the procedures, practices and kinds of behaviors that get rewarded and supported with regard to a specific strategic focus (Schneider, 1990). When the strategic focus involves *performance of high-risk operations, the resultant shared perceptions define safety climate* (Zohar, 2000). (Zohar, 2010, p.1517; *emphasis added*).

safety culture ≠ safety climate

***e.g.*, Ehrhart, M.G., Schneider, B., and Macey, W.H. (2014). *Organizational climate and culture: An introduction to theory, research, and practice.* New York: Routledge. 364p. ISBN: 978-1-84872-528-7.**

however . . . . .

this presentation will focus on the features common to both culture and climate

Occupational Health and Safety Management Systems
Environmental Health and Safety
Incident Management System (in emergency response)
Occupational Safety and Health Management Systems
Safety Management Systems

Key references: **OSH Act of 1970**

ANSI/AIHA Z10-2012

British Standard Occupational Health and Safety Management Systems, BS OHSAS 18001:2007

Friend and Kohn, 2010

Global Reporting Initiative, GRI, 403, 2018

Haight, Yorio, Rost, and Willmer, 2014

International Association of Fire Chiefs, 2015

International Labour Organization, ILO, 2009

Manuele, 2013, 2014

Myers, 2015

Nuclear Regulatory Commission, 2011

Robson, Clarke, Cullen, Bielecky, Severin, Bigelow, Irvin, Culyer, and Mahood, 2007

Occupational Safety and Health Administration, OSHA, 2016a, 2016b, 2016c

Key take-away for this presentation:

the maintenance of safety within the safety management system requires continuous monitoring, correction, and improvements

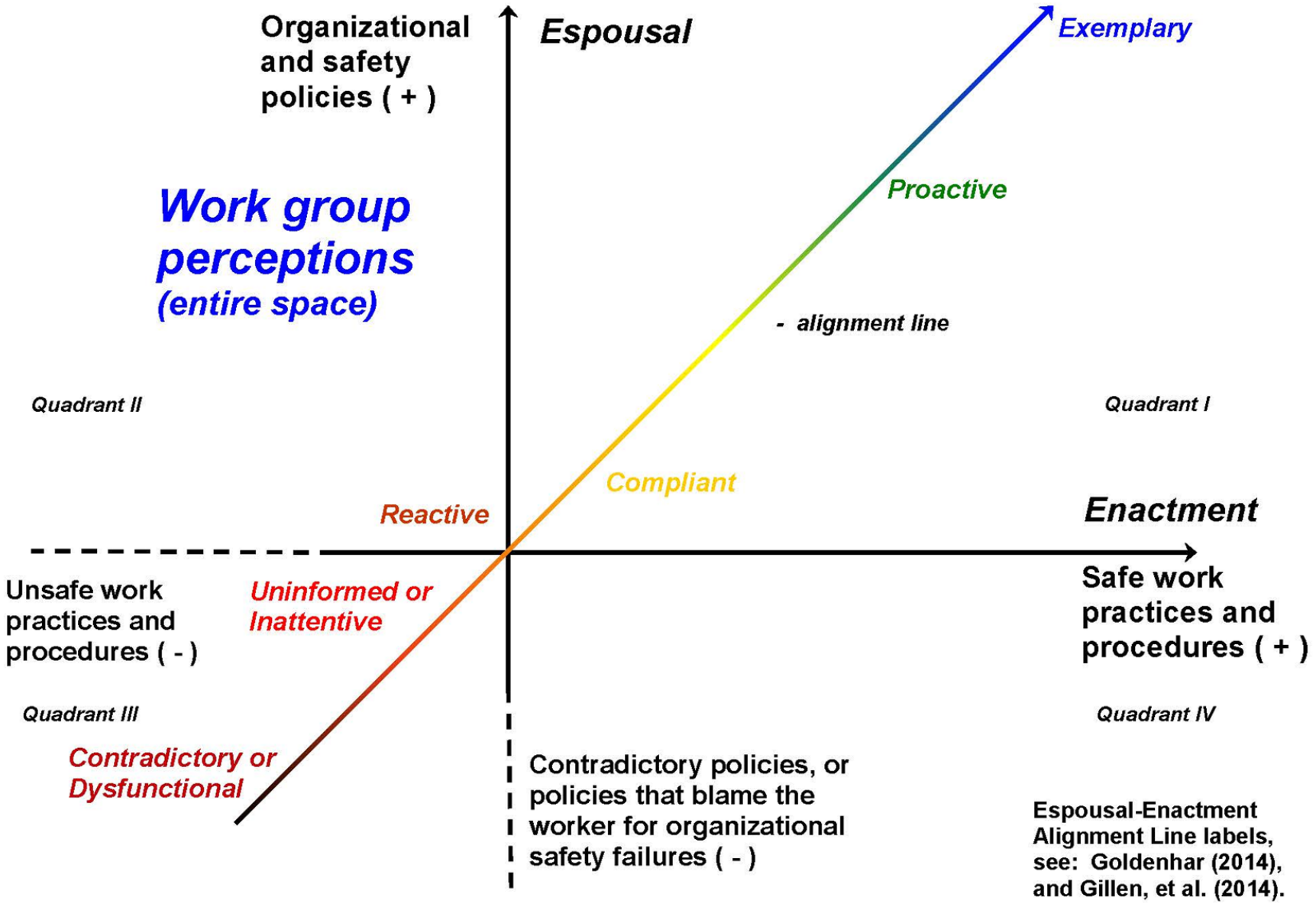
(ANSI/AIHA Z10-2012; GRI 403, 2018; Manuele, 2013, 2014; McKinnon, 2014; NAS, 2018; Reason, 1997; Robson, et al., 2007, Schneider, 2017)

1. **How is safety climate perceived or determined in the first place?**

This first argument proposes that Zohar's (2010, p.1518; 2014) comparison between "espoused and enacted priorities" is a principal mechanism for the perception of safety climate in a work crew or in an organization.

The espoused policies and enacted procedures and practices are key drivers of the organization's safety management system. This mechanism is a direct and very important connection between safety climate/culture and the overall organization of work in the hazardous work environment.

Principal Mechanism: *Espousal vs. Enactment* (Zohar, 2010).



Espousal-Enactment Alignment Line labels, see: Goldenhar (2014), and Gillen, et al. (2014).

Work group perceptions: Espousal vs. Enactment (Zohar, 2010).

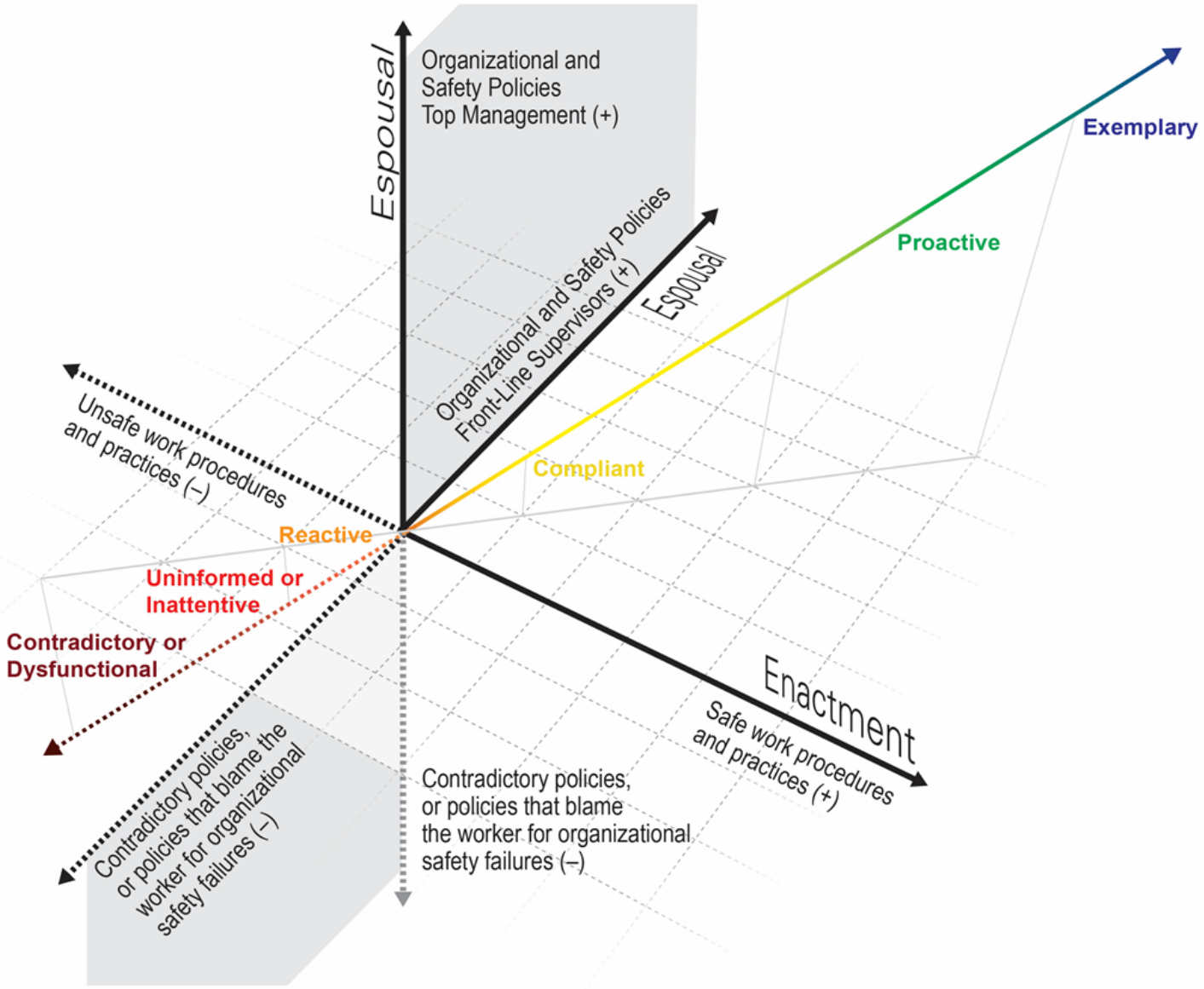


Illustration by Gino Fazio, NIOSH.

2. How do we improve safety climate?

Hypothesis:

- **one does *not* improve safety climate by acting directly on safety climate perceptions**

- **safety climate perceptions are improved or degraded by changes in the policies, procedures, and practices related to safety in the hazardous work environment**

SOPS Patient Safety Culture Composites (Hospital report)

1. **Communication openness**
2. **Feedback and communication about error**
3. **Frequency of events reported**
4. **Handoffs and transitions**
5. **Management support for patient safety**
6. **Nonpunitive response to error**
7. **Organizational learning—Continuous improvement**
8. **Overall perceptions of patient safety**
9. **Staffing**
10. **Supervisor/manager expectations and actions promoting patient safety**
11. **Teamwork across units**
12. **Teamwork within units**

3. **How do we model safety climate in the context of the overall organization of work in a hazardous work environments?**

More specifically, what is the relationship between safety climate/culture, the safety management system, the socio-technical system, and the overall organization of work in a hazardous work environment?

Figure 3. Model 1: Safety climate embedded in the overall organization of work and its safety management system.

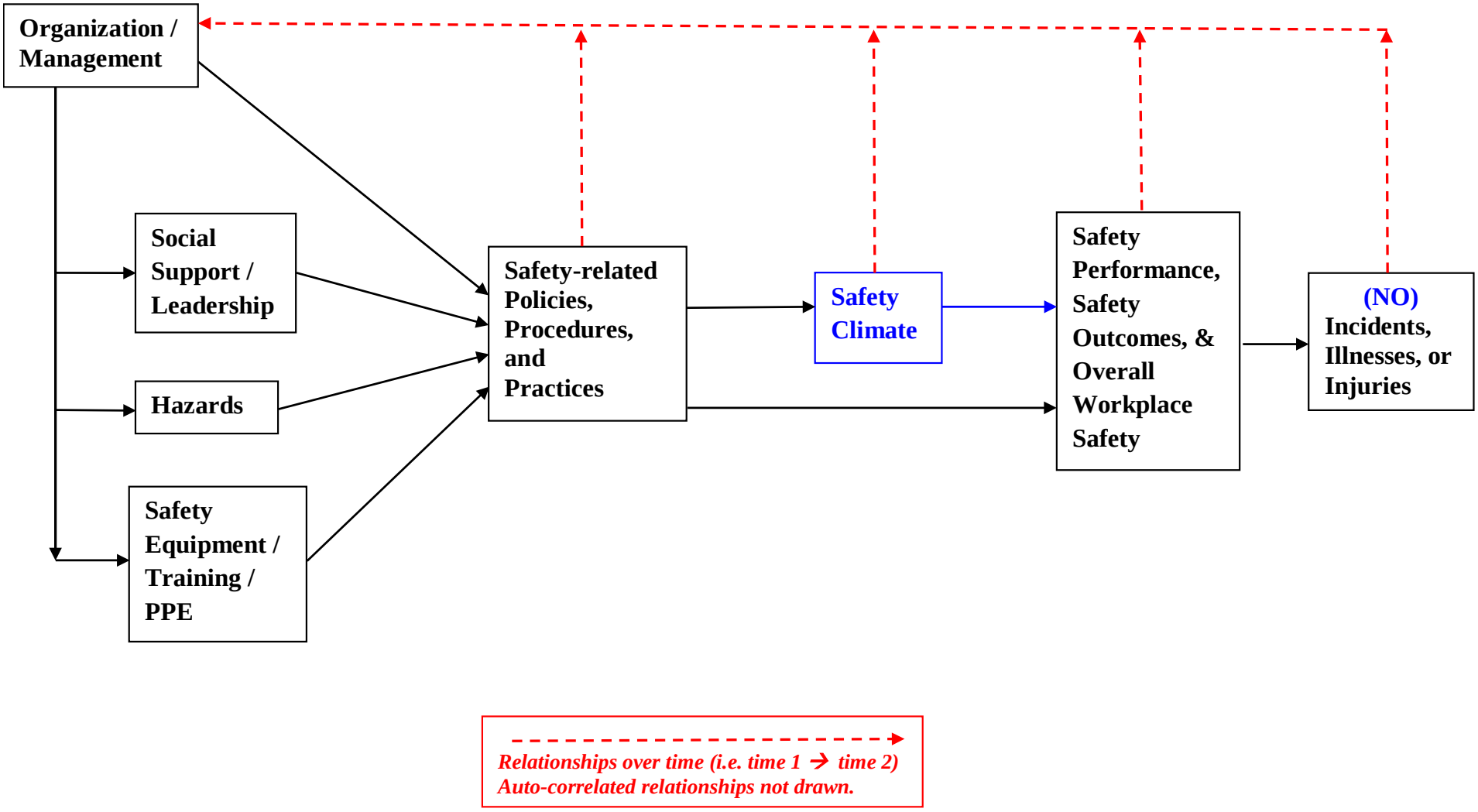


Figure 4. Model 2: Safety climate as an indicator, but outside of the immediate causal chain.

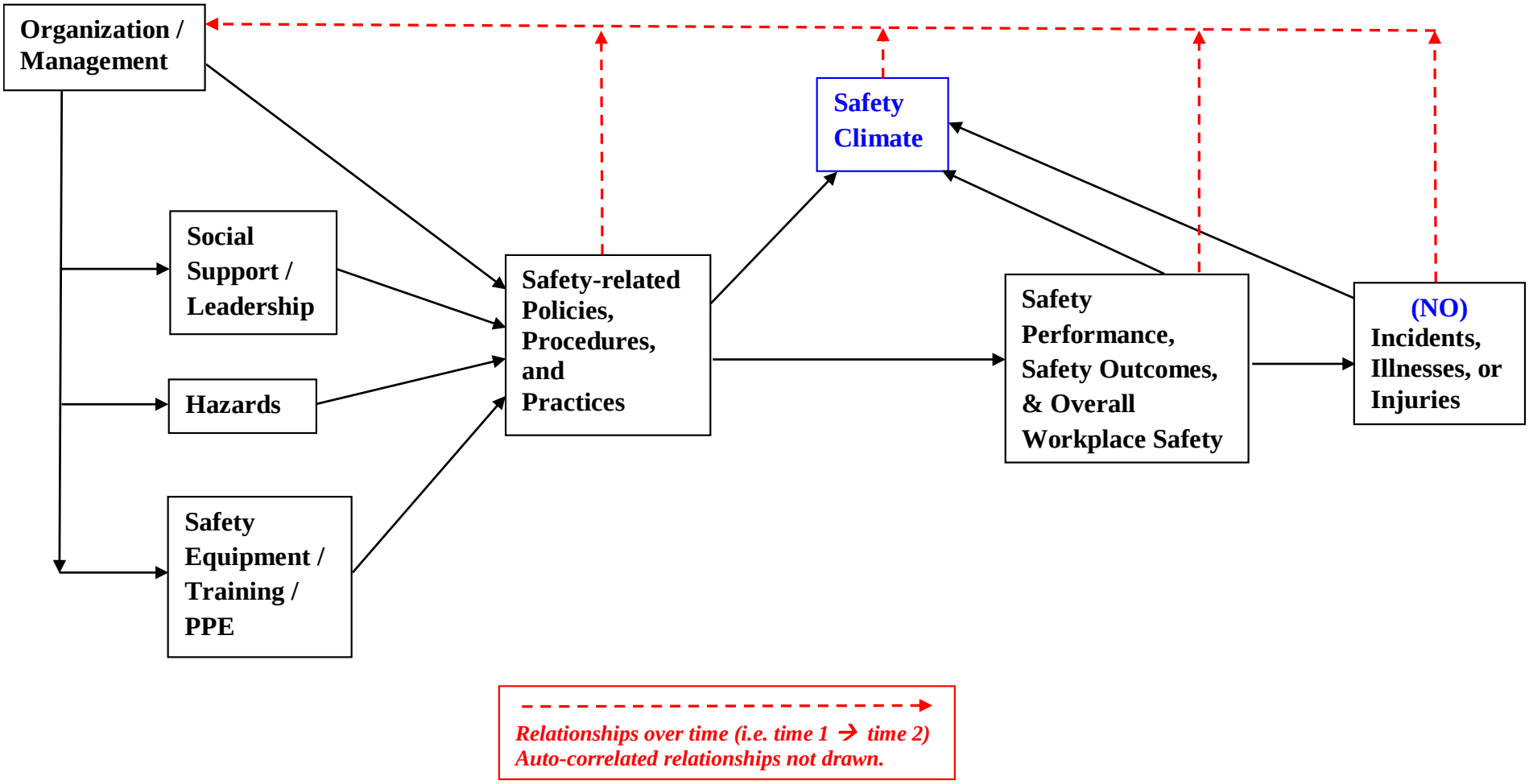
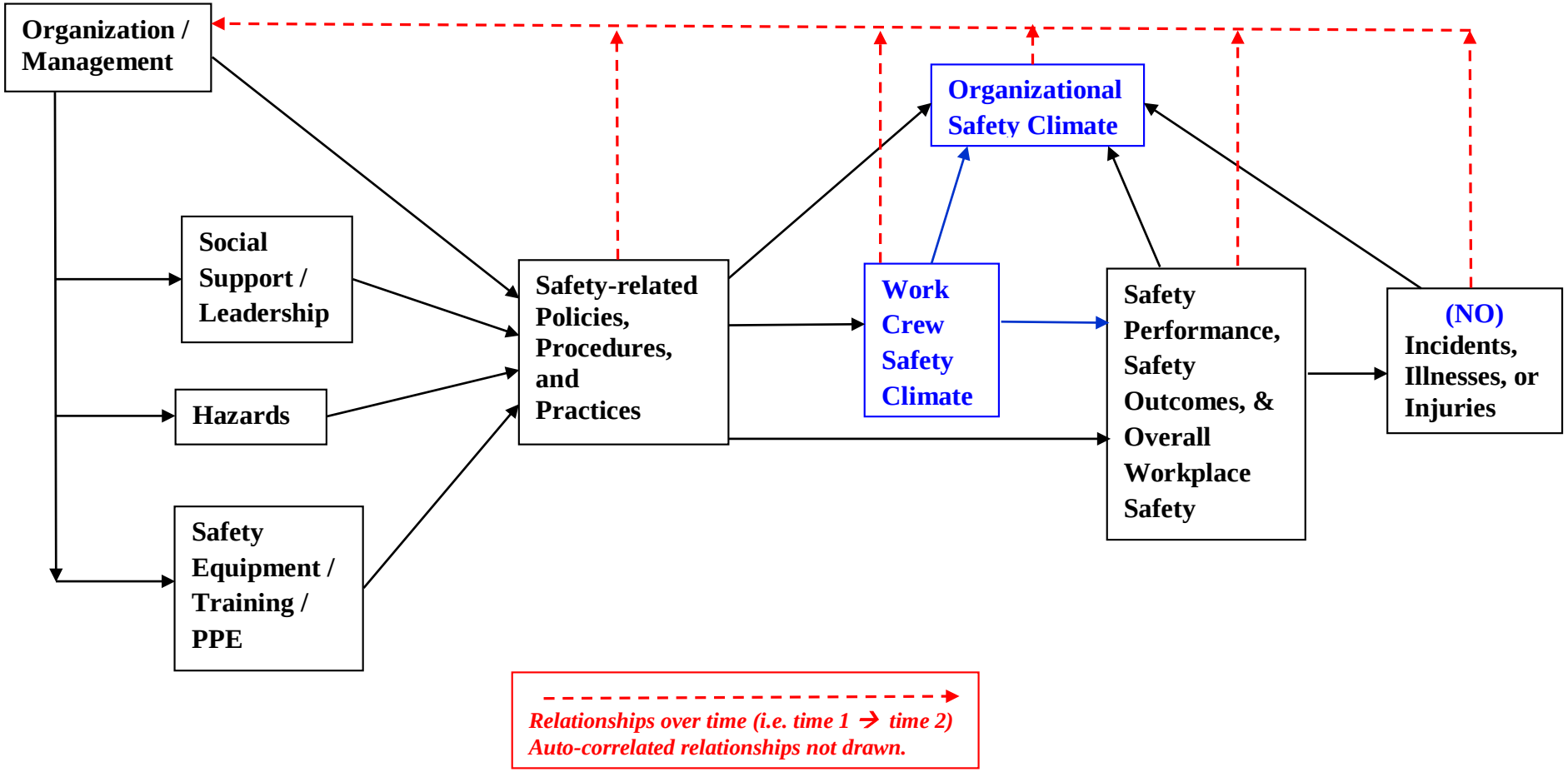


Figure 5. Model 3: One example of a hybrid safety climate model.



Whether we consider the embedded, the indicator, or some hybrid model, we must not neglect the potential effects (both positive and negative) from safety climate/culture onto the organization's workplace safety considered over time.

Conclusion: Safety climate is interdependent with its associated safety management system.

When this perspective includes the productivity and other job demands placed on the workers, the perceived safety climate and its safety management system can be seen to be two key components in the overall organization of work in a hazardous work environment (Occupational Safety and Health Administration, OSHA, 2016a, 3885).

4. What are the connections and interactions between safety climate and occupational safety and health management systems (OSHMS)?

U.S. government and NGO policy statements promoting a strong safety culture:

Nuclear Regulatory Commission, 2011
Institute of Nuclear Power Operations (INPO, 2013a; 2013b)
Bureau of Safety and Environmental Enforcement (BSEE, 2013)
National Research Council of the National Academy of Sciences (2014)
Division of Behavioral and Social Sciences and Education, NAS (2018)
Agency for Healthcare Research and Quality
Joint Commission
International Association of Fire Chiefs (IAFC, 2015)
U.S. Fire Administration (part of FEMA)

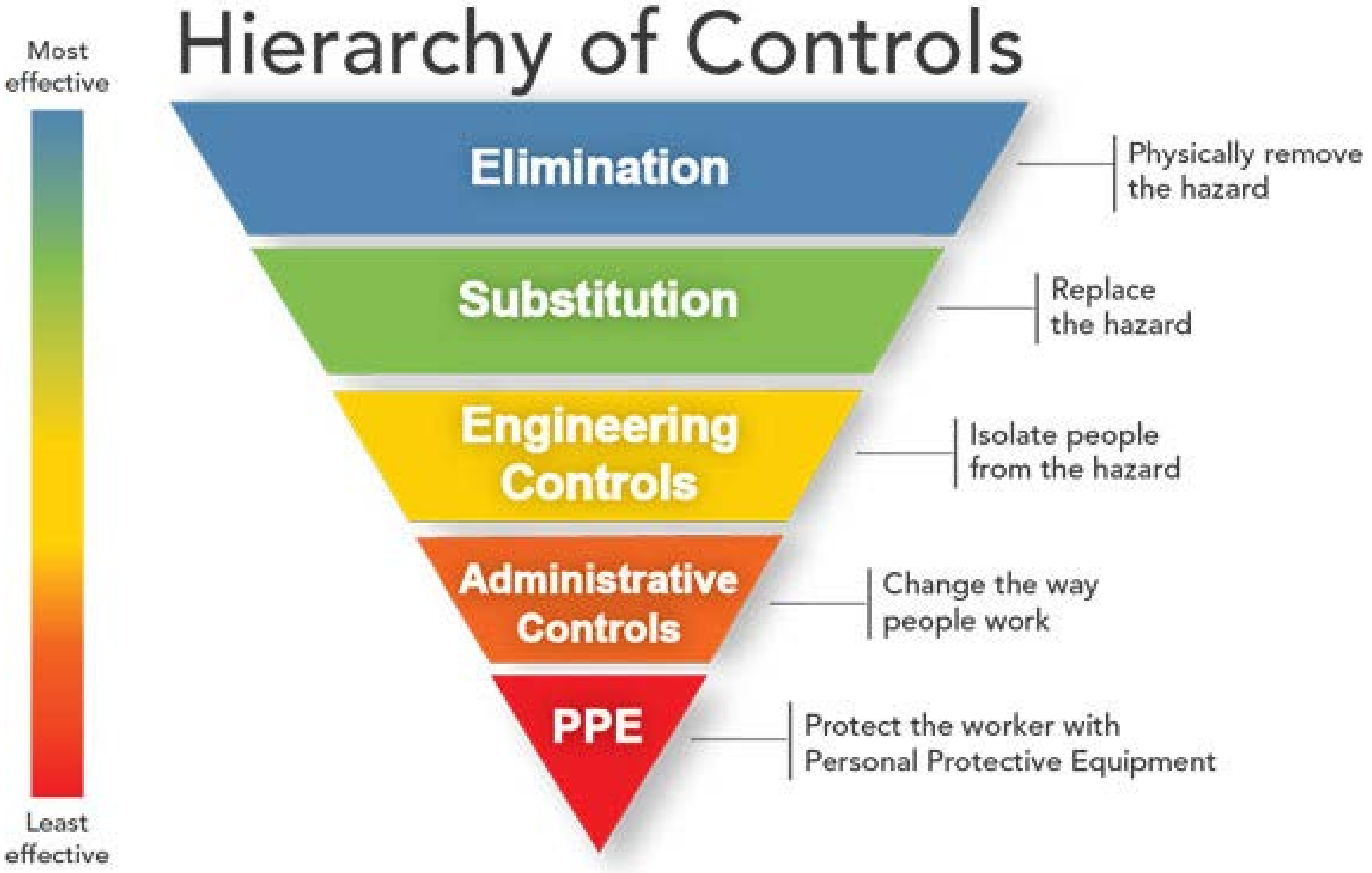
Key constructs within OSHMS's:

- **high reliability organizations**
  Dave DeJoy presentation, 12/2018
  Joint Commission

- **hierarchy of controls**

- **process safety vs. worker safety**

- **linking safety with productivity**



NIOSH Workplace Safety and Health Topics
https://www.cdc.gov/niosh/topics/hierarchy/default.html

process safety vs. worker safety:

"process safety" derives from chemical manufacturing, refining, oil and gas extraction, nuclear fuel processing, and similar industries. See the OSHA regulation: 29 CFR 1910.119.

Worker or "personal" safety is examined as a separate set of requirements, distinct and unrelated to the requirements for process safety (e.g., Hofmann, et al., 2017; National Academies of Sciences, Engineering, and Medicine, NAS, 2018).

The analogous term to "process safety" in health care is "patient safety" (e.g. Agency for Healthcare Research and Quality, AHRQ, n.d.; Pousette, Larsman, Eklöf, and Törner, 2017).

Conclusion/goal: process safety AND / WITH worker safety

linking safety with productivity:

Typical viewpoint: safety vs. productivity

Alternate viewpoint: The safest way to do the job should also be the easiest, fastest, and most productive way to get the work done (Susan Baker, Johns Hopkins).

Safety and productivity are interdependent (e.g. Beus, et al., 2016; Manuele, 2013).

When safety and productivity are evaluated as a unified process, the organization is in a better position to create and maintain a sustainable and future-oriented operation.

Safety is interdependent with the overall organization of work (GRI 403, 2018; Manuele, 2013).

The OSHA report on "Sustainability in the Workplace," (OSHA 2016c, 3409) proposes a future-oriented perspective on sustainable business practices that emphasize workplace safety and health.

Then, if:

1. Safety climate/culture is the work crew's perception of the interaction between espoused policies and enacted procedures and practices related to safety in an organization; *And if,*

2. Safety climate/culture is improved by safety-related improvements in the workplace policies, procedures, and practices; *And if,*

3. Safety climate is an immediate or slightly lagging reflection and indicator of the relative safety of these policies, procedures, and practices; *And if,*

4. Safety is interdependent with productivity; *Then,*

Over time, safety and productivity are also interdependent with safety climate/culture.

Where do we go from here?

Where do we go from here?

“ . . . . the space where all of us who are interested in safety climate should be spending our time – is actually in designing interventions, in evaluating them, in getting involved in the implementation science.”

Prof. Jennifer Taylor, Drexel University
National Occupational Injury Research Symposium May 20, 2015

A few additional resources:

Foundations for Safety Leadership, CPWR

How to Improve the Safety Climate on Your Construction Site:

- **worker participation**
- **right to refuse**
- **close call reporting and analysis**
- **leadership by supervisors**
- **subcontractor prequalification and oversight**
- **integrating safety as a value into a company**
- **owner involvement**

NIOSH. (2006). ***Information Circular 9490: Job training analysis: a process for quickly developing a roadmap for teaching and evaluating job skills.***

Recall:

AHRQ SOPS Patient Safety Culture Composites (Hospital report)
https://www.ahrq.gov/sops/index.html

2. **Feedback and communication about error**
3. **Frequency of events reported**
6. **Nonpunitive response to error**

Joint Commission: 11 Tenets of a Safety Culture:

1. **Apply a transparent, nonpunitive approach to reporting and learning from adverse events, close calls and unsafe conditions.**
2. **Use clear, just, and transparent risk-based processes for recognizing and distinguishing human errors and system errors from unsafe, blameworthy actions.**
4. **Policies support safety culture and the reporting of adverse events, close calls and unsafe conditions. These policies are enforced and communicated to all team members.**
5. **Recognize care team members who report adverse events and close calls, who identify unsafe conditions, or who have good suggestions for safety improvements. Share these "free lessons" with all team members (i.e., feedback loop).**

How to Improve the Safety Climate on Your Construction Site:

- **close call reporting and analysis**

Many recommendations to discuss, but one stands out:

Beyond Zero

Some companies obsessed with reaching zero do not realize that zero incidents are probably not achievable. Furthermore, even with zero incidents, close calls occur. A goal of zero incidents may incentivize underreporting. Thus, zero incidents is probably not a reasonable goal. . . . .

Compare to: **Leading the Way to Zero**

https://www.jointcommission.org/leadingthewaytozero.aspx

LABORERS' HEALTH & SAFETY FUND OF NORTH AMERICA

Laborers' International Union of North America

LiUNA!

PUBLIC HEALTH HUMAN RIGHTS SCHOOL OF PUBLIC HEALTH DREXEL UNIVERSITY

Drexel UNIVERSITY

Discussion / Questions

AUBURN UNIVERSITY

COLLEGE OF LIBERAL ARTS

DEPARTMENT OF HEALTH AND HUMAN SERVICES · USA

CDC Workplace Safety and Health

National Institute for Occupational Safety and Health NIOSH

Appendix. Terminology: Various uses of the terms, "policies," "procedures," and "practices," in the published literature may lead to ambiguities in interpretation. This presentation uses the terms, "policies," "procedures," and "practices," as predictor variables with respect to safety climate and to overall workplace safety. Terms used as outcome variables are, "overall workplace safety," "safety outcomes," and "safety performance." These definitions have been fashioned to clarify and distinguish terms in this manuscript, and may not reflect the use of these terms in the broader scientific literature.

policies – "policies" are confined to written and oral statements by all levels of management. The focus of this paper is on safety-related policies, but this term also includes policies describing the overall design and organization of work. For example the socio-technical policy decisions made when planning the operations determine a great deal regarding the procedures that will be required

procedures – "procedures" define how policies are to be carried out in an organization. In this sense, procedures connect policy with practice, and espousal with enactment (Zohar, 2010). For example, safety-related procedures specify how safe-work practices are to be conducted. Overall organizational procedures may have a major impact on workplace safety as well, e.g. by determining the level of staffing required for specific tasks.

practices – "safe-work practices" refer to the actual work methods carried out to manage safety. As such, practices may be seen as both predictor and outcome in an organization. To resolve this potential ambiguity, we confine "practices" to the common or customary methods and standards that are agreed-upon to complete a given task. These methods may be adopted by a single work crew or followed throughout an organization, and they include any short-cuts with respect to safety that are commonly used.

Appendix. Terminology, continued:

safety performance – "safety performance" is the immediate outcome of the prescribed policies, procedures, and practices, and it measures the actual activities of workers in hazardous work environments. Safety performance is a major component of overall workplace safety.

safety outcomes – "safety outcomes" describe the incidents, injuries, and illnesses that may result from failures in overall workplace safety, including failures in safety performance.

overall workplace safety – "overall workplace safety" is the organizational consequence/result of the safety-related policies, procedures, and practices in the organization. In this paper, workplace safety is conceptualized as the broad overview and summary of all workplace safety consequences/outcomes.

organizational outcomes – organizational outcomes are distinguished from overall workplace safety with respect to organizational consequences which are traditionally not included in a determination of safety but do impact organizational sustainability. Examples of such outcomes are costs associated with delays in the contract, as well as positive results because the work has proceeded safely and without interruption (Dave DeJoy, personal communication, 2018).

For additional consideration of these terms, see for example: Burke, Sarpy, Tesluk, and Smith-Crowe (2002); Clarke, et al. (2009); Friend and Kohn (2010); Griffin and Neal (2000); Kaplan and Tetrick (2011); Manuele (2013); Neal, Griffin, and Hart (2000); Schneider and Barbera (2014a); Schonfeld and Chang (2017a); Tarrants (1980); Zohar (2014); Zohar and Hofmann (2012); and Zohar and Luria (2005).