

Risk Perception & Creating a Sense of Vulnerability

Anna Floyd, Ph.D.

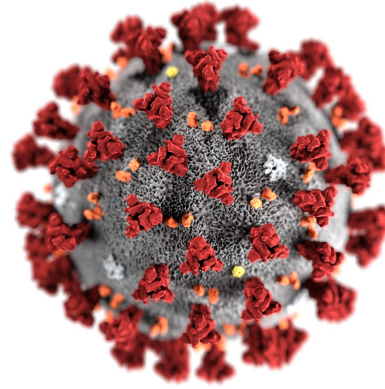
Social & Health Psychology



AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

Long Beach Chapter

**Sept 24, 2020
12:00 PT**



At the end of March, 2020, how much did you agree or disagree with the following statements?

1. I am at risk of contracting COVID-19.
(Answer range 1-5; Strongly Disagree - Strongly Agree)
2. If I contracted COVID-19, the effects for myself or my family could be detrimental.
(Answer range 1-5; Strongly Disagree - Strongly Agree)
3. My closest friends and family are concerned about contracting COVID-19.
(Answer range 1-5; Strongly Disagree - Strongly Agree)
4. I personally know someone who has tested positive for COVID-19.
(Answer range 1-5; I haven't heard of anyone who actually has COVID-19 - Someone in my family has COVID-19)
5. I personally know someone who died from COVID-19.
(Answer range 1-5; I haven't heard of anyone who has died - Someone in my family died)
6. I believe that using a face mask will reduce the spread of COVID-19.
(Answer range 1-5; Strongly Disagree - Strongly Agree)
7. I have a good, high quality face mask at home.
(Answer range 1-5; No mask - Yes, high quality mask)

Overview

- Safety training for low frequency/high consequence hazards* poses unique challenges.
- In this presentation, we will look at:
 - 1) the challenge posed by these low frequency/high consequence hazards,
 - 2) the psychology behind risk perception and behavior change, and
 - 3) how you can use risk to make your safety trainings more effective.

* Typically the hazards with high potential for serious life changing or fatal injuries (SIF)

A Manager's Perception of Risk



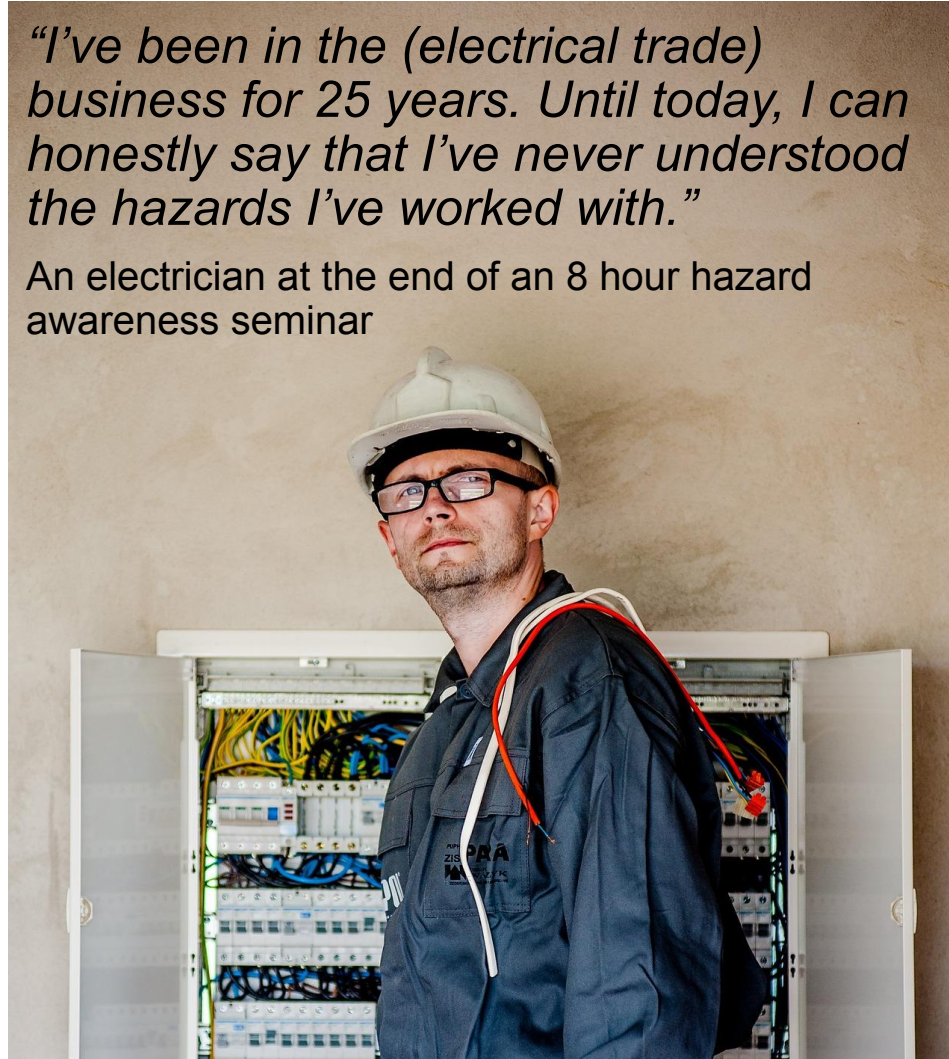
*“How could this have happened? We have **the best safety record** in our division. We’ve **never had a lost time electrical injury** at this plant. He is **the most knowledgeable person** in the crew. He has never had a recordable injury. I was not aware that my employees were exposed to a hazard with such severity. I don’t understand.”*

A plant manager commenting during an arc flash injury investigation

A Worker's Awareness of Risk

"I've been in the (electrical trade) business for 25 years. Until today, I can honestly say that I've never understood the hazards I've worked with."

An electrician at the end of an 8 hour hazard awareness seminar



**How can we help raise awareness of the hazards with
SIF potential that workers work with every day?**



Current State of Safety Trainings

- Safety professionals understand importance of
 - training needs assessments
 - content design, and
 - delivery methods

What We Can Add

- *Perceptions of risk* are key to workers' adoption of safety protocol
- Three key points:
 1. An appropriate definition of “risk” for low frequency / high consequence hazards.
 2. *Why* is a perception of risk is useful in the workplace? (Psychology)
 3. Using stories can help establish a perception of risk in the workplace.

1.

An appropriate
definition of “risk” for
low frequency / high
consequence
hazards.

Defining Risk

An accurate perception of risk that is based only on *likelihood of incident* may be inappropriate for some hazards.



Suppose....

You accept an “unlikely” 1 in 1,000 chance every day.

The probability of a serious incident over 20 years is...

98%



Low Frequency/High Consequence Events

Non-Fatal Lost Time Injuries (U.S.)

Type of Non-Fatal Injury	No. Injuries (2010)
Total	1,191,100
Sprains, strains, tears	474,000
Musculoskeletal disorders	346,300
Falls on same level	182,400
Struck by object	138,530
Falls to lower level	73,520
Assault/Violent act by person	40,310
Highway accidents	36,460
Assault/Violent act by animal	7,160
Fires and explosions	3,000
Electrical shock and burn	1,890

Less than 0.2% of Lost Time non-fatal
Injuries....

Ratio of Lost Time Injuries to Fatal Injuries (U.S.)

Event or Exposure	LTI / Fatality Ratio*
Fires & Explosions	12
Contact with electricity	13
Transportation accidents	25
Assaults & violent acts	28
Fall to a lower level	104
Caught in, compressed or crushed	134
Struck by object	323
Falls on same level	2056
Struck against object	8414
Slips or trips without fall	12593
Overexertion in lifting	14033

*Lost Time Injury to Fatality Ratio;

....but extremely high potential to be fatal

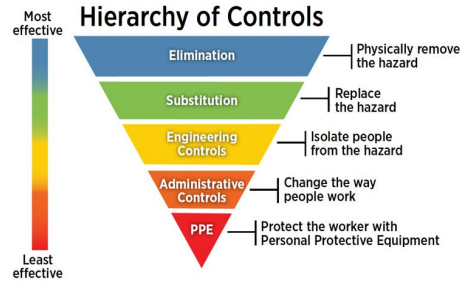
Defining Risk

An accurate perception of risk that is based only on *likelihood of incident* may be inappropriate for some hazards.

Low frequency/high consequence hazards pose unique challenges to defining risk in safety training.



Hierarchy of Controls



Hierarchy of Control Measures

Control Effectiveness

Elimination

Eliminate the hazard during design

Substitution

Substitution of less hazardous equipment, system or energy

Engineering Controls

Design options that isolate workers from hazards

Warnings

Automatic or manual, permanent or temporary, visible or audible warning systems, signs, barriers and labels

Administrative Controls

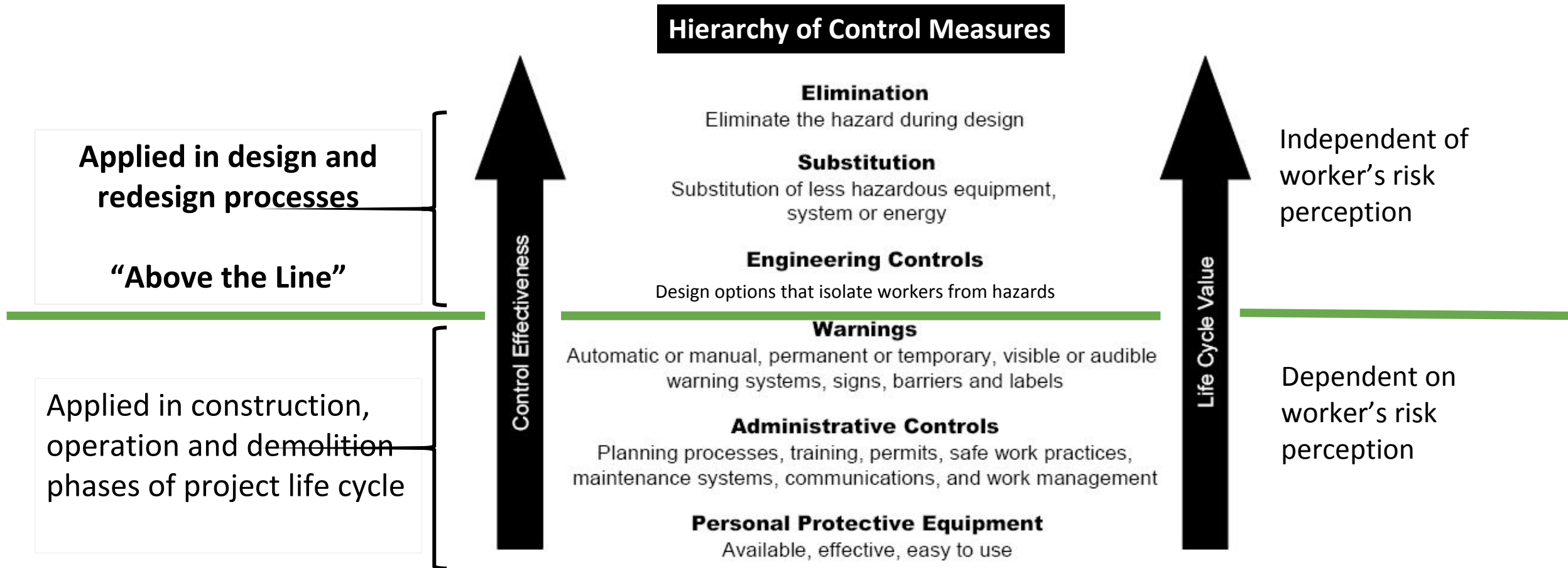
Planning processes, training, permits, safe work practices, maintenance systems, communications, and work management

Personal Protective Equipment

Available, effective, easy to use

Life Cycle Value

Hierarchy of Controls



2.

Why a perception of
risk is useful in the
workplace?
(Psychology)

Definition of Risk

To fully understand “risk perception”, we need to look at several dimensions of risk.

Definition of Risk

Dimension of Risk	Description of Dimension	Example Thought from a Hypothetical Individual
1. Perceived Likelihood	Individual's perception of the probability a hazard may occur.	<i>I have a low likelihood of encountering an incident on the job this year.</i>
2. Perceived Susceptibility	Individual's perception of vulnerability to a hazard.	<i>I am not likely to get burned on the job, even if an incident occurred.</i>
3. Perceived Severity	Individual's perception of the degree of harm that a hazard would cause.	<i>If I were to be burned, it wouldn't be so bad.</i>

adapted from Brewer et al., 2007

Definition of Risk

A person's understanding of risk includes how **likely** they think the hazard is, how **susceptible** they think they are to the hazard, and how **severe** they think the consequences would be.

Risk Perceptions Drive Behavior Change

The main goal of safety trainings is **to influence behavior.**

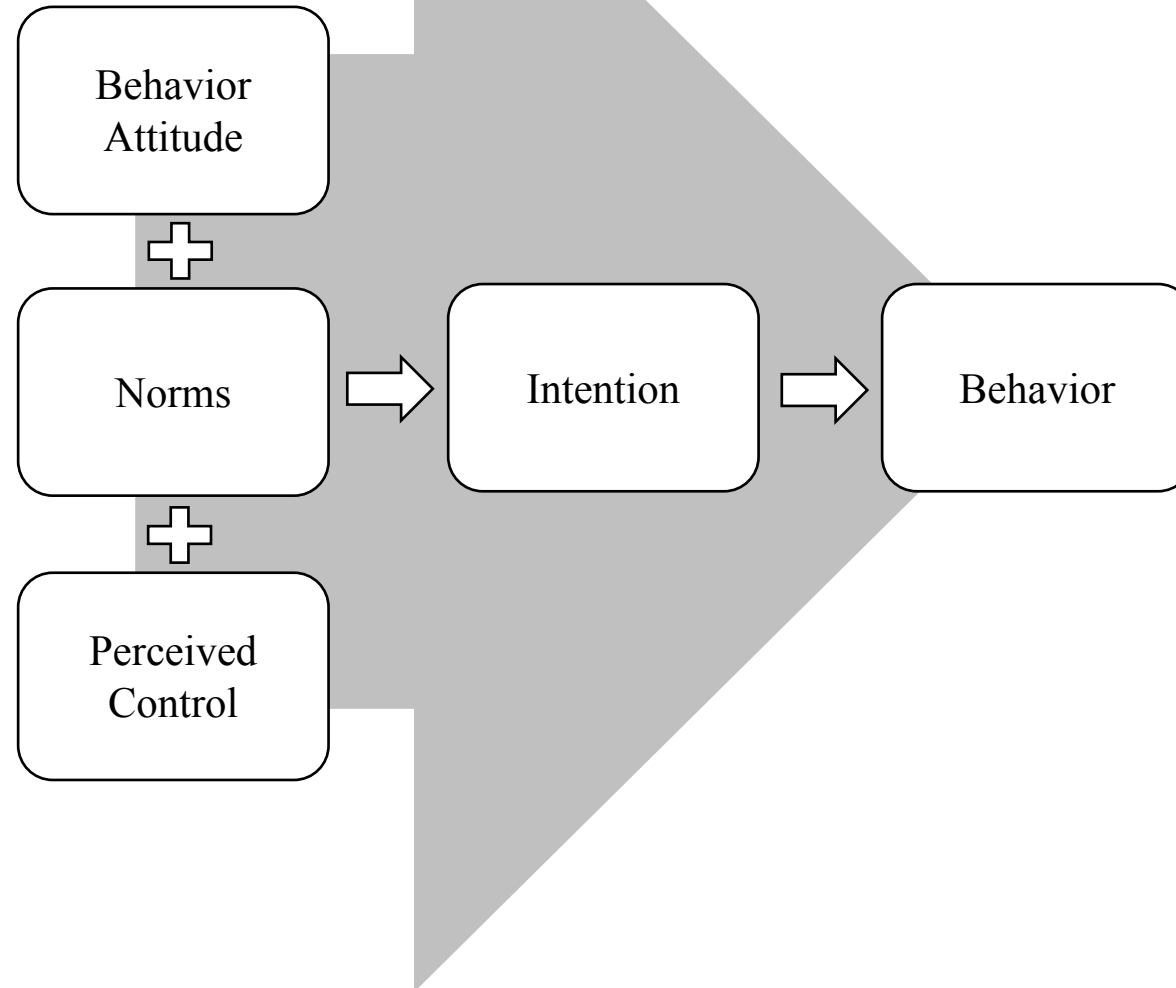
Psychological research tells us that **behaviors are influenced by perceptions of risk**

Risk perceptions can be used to drive behavior change!



Theory of Planned Behavior:

a person's *intention to enact* a protective behavior



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I am at risk of contracting COVID-19

If I contracted COVID-19, the effects for myself or my family could be detrimental.

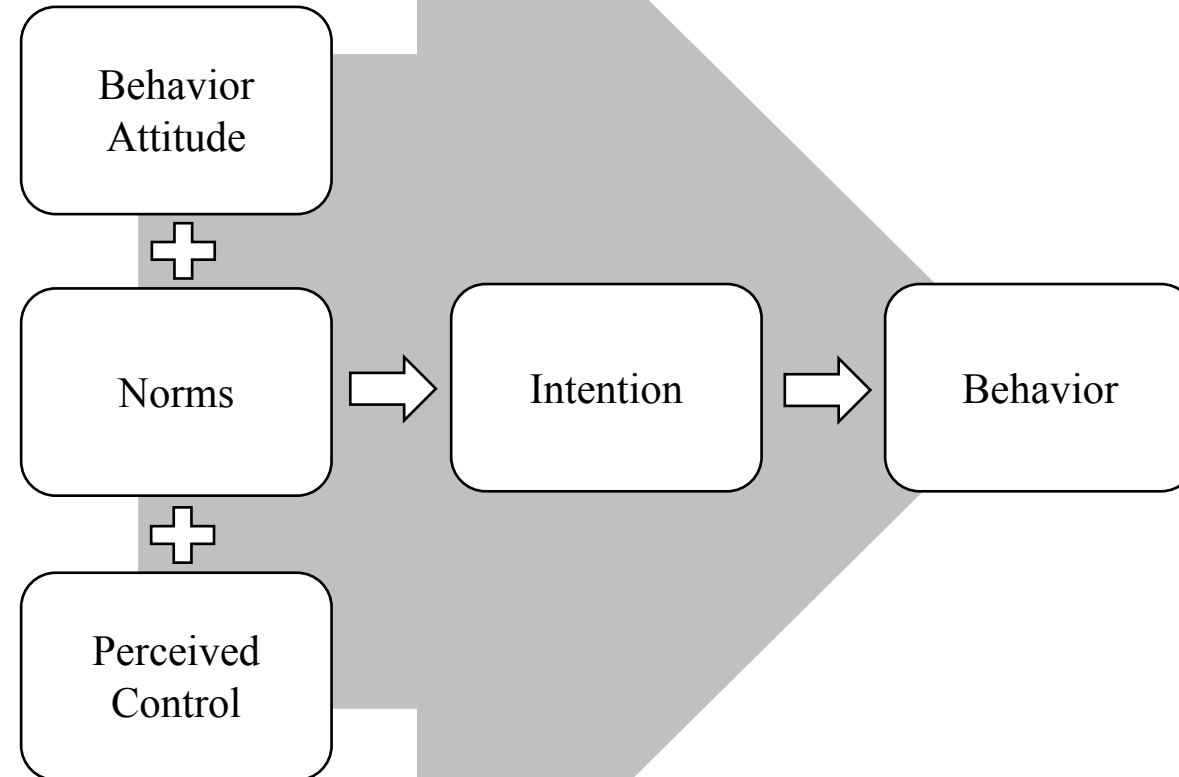
My closest friends and family are concerned about contracting COVID-19.

I know someone personally who has tested positive for COVID-19.

I know someone personally who died from COVID-19.

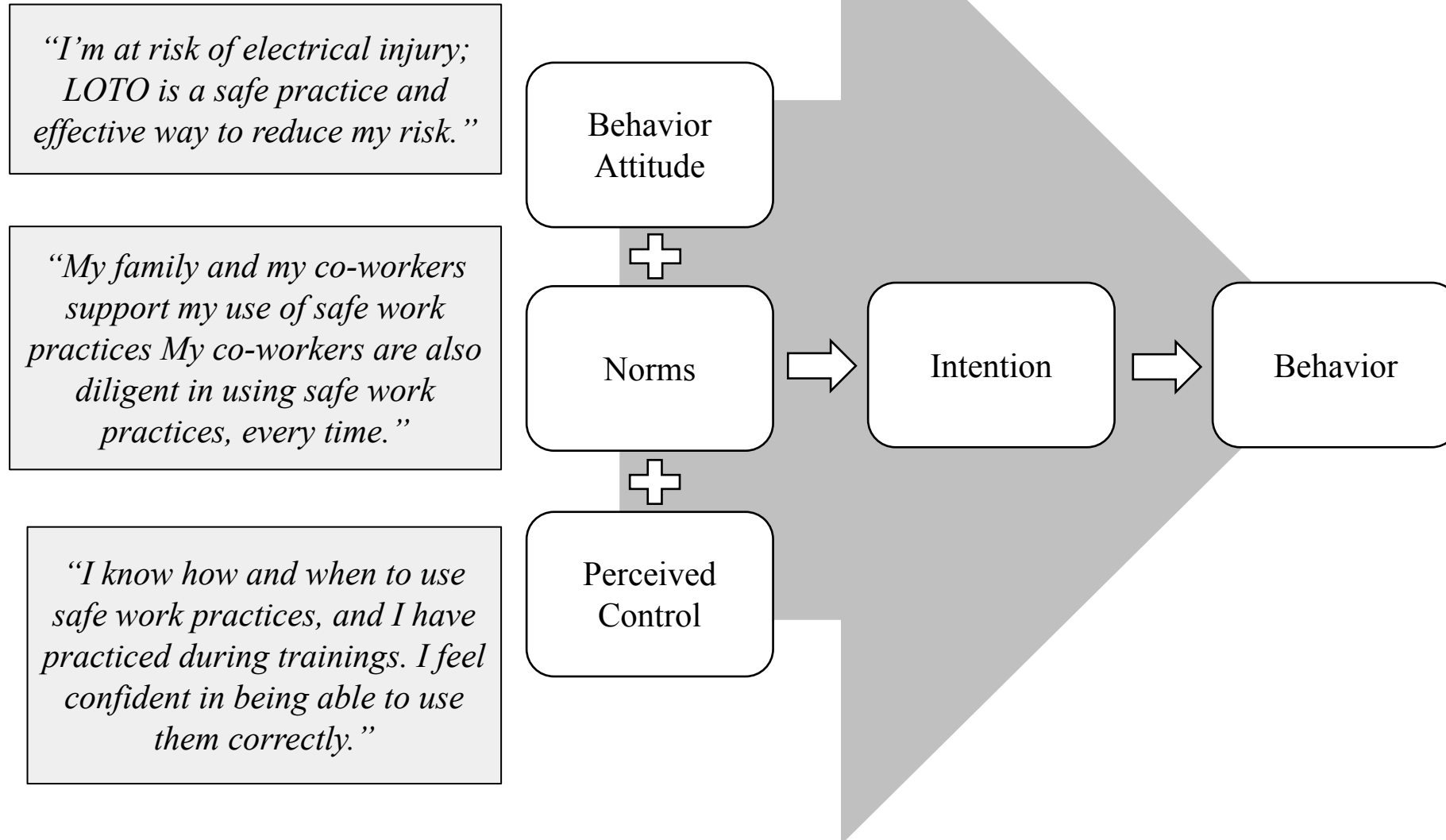
I have a good, high quality face mask at home.

I believe that using a face mask will reduce the spread of COVID-19.



Theory of Planned Behavior:

a person's *intention* to enact a protective behavior



3.

Using stories can help establish a perception of risk in the workplace.

Risk Perceptions are Feeling-Based



- People *primarily* use a feelings-based cognitive system to make decisions.
 - Especially when:
 - Decision is complicated
 - Time is limited
 - Tired, hungry, preoccupied
- Feelings-Based System is based on:
 - Past experience
 - Strong emotional experiences (e.g., past trauma)

Our *feelings* are strongly connected to *stories*.

Establishing Risk: Others' Stories

- People are naturally drawn to stories.
- Experiences and opinions of *other people* play a key role in how we perceive appropriate actions and behaviors
- These other people can be characters in a *narrative*, or story
- The more similar people perceive themselves to be to a narrative character, the more likely they are to be persuaded by the narrative itself.



Establishing Sense of Risk: Others' Stories



we 'blame the victim' and distance ourselves
"That would never happen to me."



we put ourselves in their shoes (only if we can relate to the person)
"That could have been me!"

Example: Narrative, Stories and Perceptions of Risk



“There are 1,890 electrical shock and burn injuries each year.”

“That would never happen to me.”

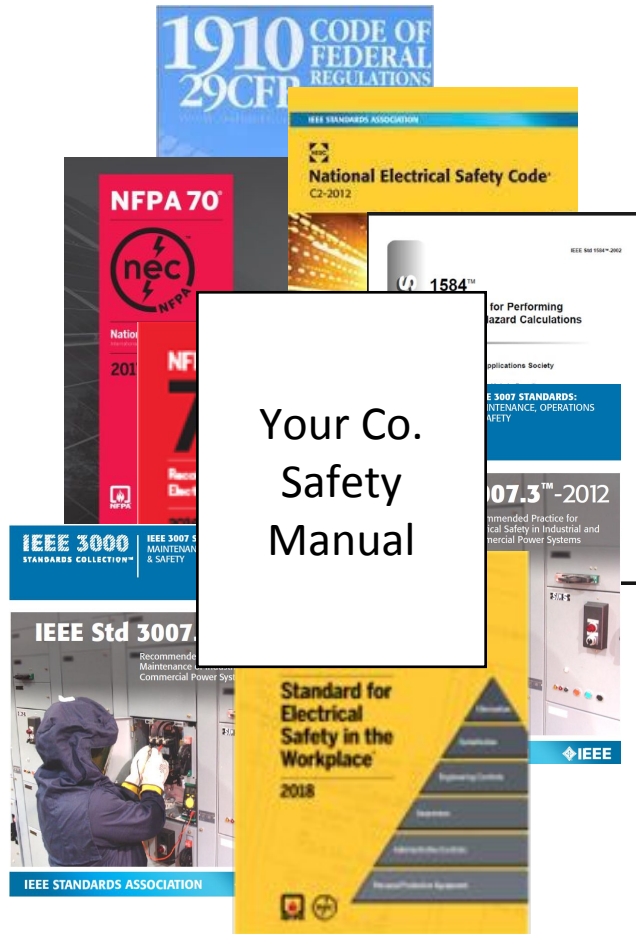


“Last Friday, one of our linemen was critically injured in an electric shock incident. His spouse and their two children have spent the week visiting him in the hospital.”

“That could have been me!”

Summary

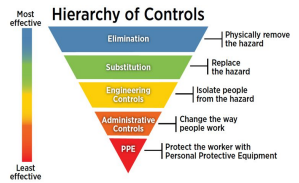
I know the rules...



...but do we understand the risk?



Summary



- Workers and managers don't understand the risk of low frequency/high consequence hazards.
- Definition of risk based on likelihood is not enough.
- Better definition of risk includes: likelihood, susceptibility, severity
- Design can reduce risk.
 - Psychology comes into play with lower order controls.
- Risk perceptions will drive behavior.
- Risk perceptions are based on attitudes, norms and feelings.
- Stories change people's feelings (and, therefore, risk perceptions).

To Learn More

- Cover article *ASSE Journal of Professional Safety*, April 2014

The Value of Vulnerability

Helping Workers Perceive Personal Risk

By Anna H.L. Floyd and H. Landis Floyd II



Many safety professionals have likely heard comments like these:

"How could this have happened? We have the best safety record in our division. We've never had a lost-time electrical injury at this plant. He is the most knowledgeable person in the crew. He has never had a recordable injury. I was not aware that my employees were exposed to a hazard with such severity. I don't understand."

—Plant manager commenting during an arc-flash injury investigation

"I've been in the business (electrical trade) for 25 years. Until today, I can honestly say that I've never understood the hazards I've worked with."

—Electrician at the end of an 8-hour hazard awareness seminar

This arc-flash incident caused a lost-time injury that led to long-term disability. As the quote shows, the plant manager's disbelief is entangled with his justification of the worker's qualifications as the "most knowledgeable person in his crew." In short, the manager does not understand how such a horrible event happened to a person whose knowledge of rules and regulations was so complete.

Almost as if in response to the questions posed by that plant manager, the second quote is from a 25-year veteran

electrician who was well versed in electrical safety regulations and various employers' safety rules (which was what most of his safety training had addressed). However, he had no perception of how severe the harm could be. The electrician admitted he did not fully understand the hazards of electricity, yet he, his coworkers and employers viewed him as a qualified electrician. During a course on electrical hazards, he realized his avoidance of injury was sheer luck.

So, how can SH&E professionals improve worker training to increase workers' understanding of their personal vulnerability, which ultimately affects their tactful adoption of safety protocols? ANSI/ASSE Z490.1-2009, *Criteria for Accepted Practices in Safety, Health and Environmental Training*, provides a framework based on best practices in planning, developing, delivering and assessing safety training.

Most safety professionals understand that needs assessments, content design and delivery methods affect training effectiveness. They also recognize the need to engage adult learners through techniques such as role-playing, group projects, guided learning, storytelling and peer coaching because adults learn differently than children and do not respond well to content-focused education (Fanning, 2011). Work culture is another key consideration (Cullen, 2011).

However, SH&E professionals must also recognize, as Lehmann, Haight and Michael (2009) conclude, that workplace safety training alone is not adequate enough to produce appropriate risk

IN BRIEF

- Safety training is most effective when it helps employees establish a personal sense of vulnerability or a heightened risk perception that consequently creates a positive shift in safety-related behaviors.

- This article combines psychology research findings about how an individual's risk perceptions are formed and how those perceptions influence subsequent behavior with practical experience involving high-risk occupational hazards that have the potential to cause disabling injury or death.

Anna H.L. Floyd, Ph.D., is a professor of psychology at Regis University in Denver, CO. Floyd has studied, conducted research and published papers on behavior change, risk perception, addiction, college student health behaviors, chronic illness and physical activity. She directs the psychology program within the College of Professional Studies at Regis University. Floyd is a member of the Institute of Electrical and Electronics Engineers, Society of Behavioral Medicine and American Psychological Association.

H. Landis Floyd II, P.E., CSP, CMRP, is principal consultant and global electrical safety competency leader with DuPont in Wilmington, DE. He is responsible for improving management systems, work practices and the application of technologies critical to electrical safety performance in all DuPont operations. He also applies this knowledge to electrical safety products and services DuPont brings to the marketplace. Floyd is a Fellow of the Institute of Electrical and Electronics Engineers and an adjunct professor in the Advanced Safety Engineering and Management program at University of Alabama at Birmingham. He holds a B.S. in Electrical Engineering from Virginia Tech and is a professional member of ASSE's Delmarva Chapter.



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