

Live Safety Demonstrations: Investing the impact of naturalistic demonstrations on emotion and situational interest



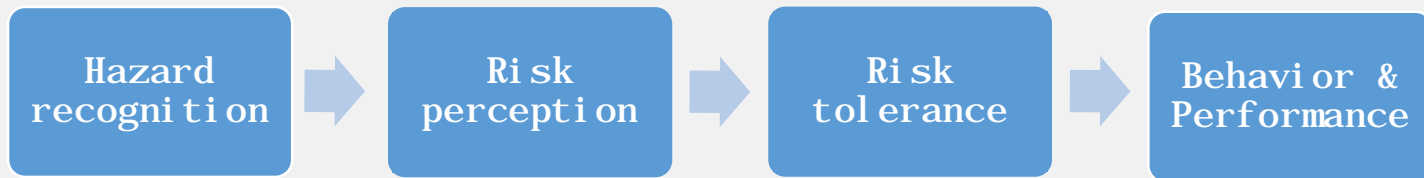
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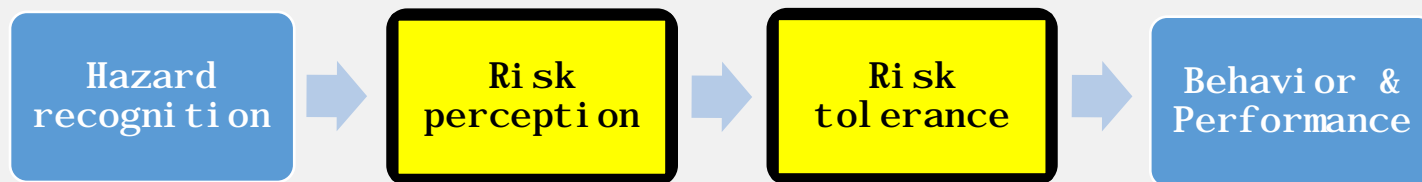
When you think of safety training, what do you think of?

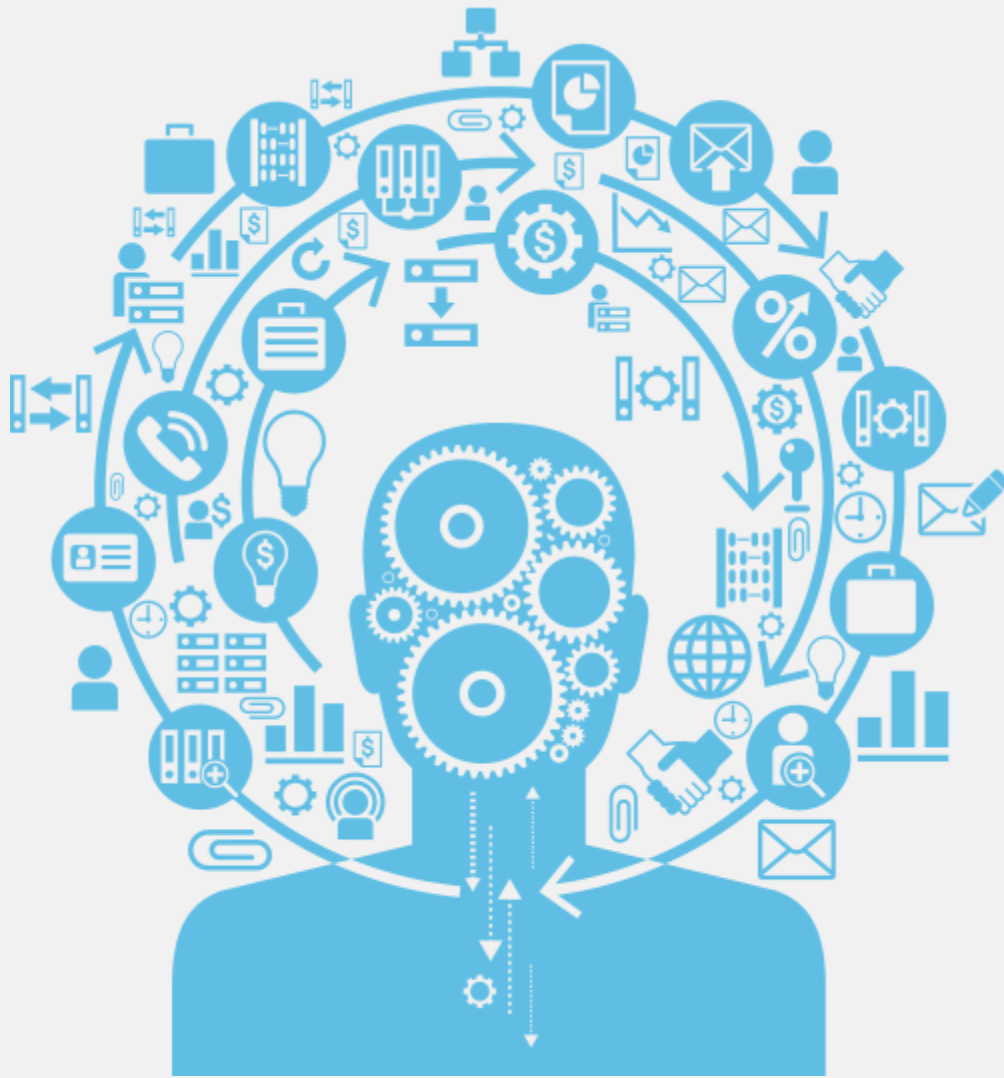




“Knowledge is not equipped until someone gets hurt. And that’s a damn shame.”

- Worker following a fatality





EXPERIENCE

Research has found that there is only one factor that impacts risk tolerance.

So, how do we give workers the experience of being injured
without injuring them?

Engage. Learn. Remember. Apply.

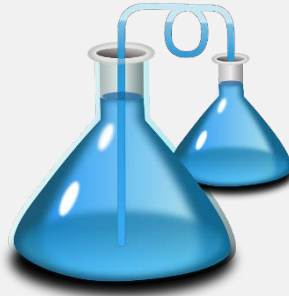
ConocoPhillips



Our hypothesized solution.



Develop demos



Run experiment



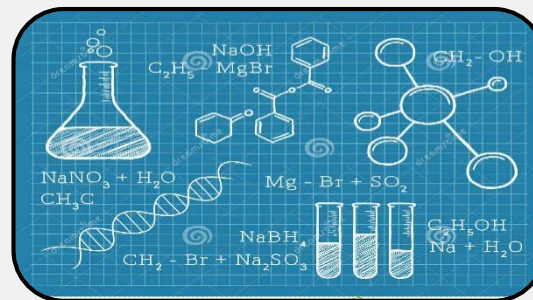
Implement solutions



This effort involves the continuum of research to practice



1. Based on real events



3. Grounded in science



2. Medically accurate



4. Engaging delivery

Characteristics of the demos.



Based on real events.



“During the installation of formwork, a 3-lb concrete chisel fell 10 feet severing the radial artery and breaking 3 metatarsals”

ConocoPhillips

Final HSE Alert

Project Development & Procurement

Incident Sharing Incident Prevention Incident Learning

Cut Hand on Sharp Edge

Business/Facility/Site: WES, Teesside	Alert No.: LTC 031	Contact: Steve Edwards
Incident Date: June 26, 2012	Location: Compressor Deck	Impact No: 200639
Consequence: Minor Injury	Severity (Actual): 1	Risk Ranking (Potential): Low

Incident Description:

The injured party was marking out a line on a tubular using chalk. He removed his rigger glove to enable him to grip the chalk and to afford more finger dexterity. As he moved his hand across the surface of the tubular, he caught the side of the palm and received a small cut. The IP stopped work and went to the on site nurse, who cleaned the cut and dressed it. The IP returned to work shortly after and received no further treatment.

Key Findings:

- The IP was wearing standard issue PPE at the time of the incident.
- The IP only had one pair of heavy duty type gloves.
- The IP was unaware of the burr on the tubular.
- There was sufficient lighting in the area.

Typical tubular section with cap now covering the area that required preparation.

How Could This Be Prevented? / What Lessons Were Learned?:

- It is recommended that all manual tasks should be carried out wearing gloves of some description.
- If additional dexterity is required, then thinner 'sum-grip' gloves should be worn (to EN 388).
- A toolbox talk was carried out to discuss the requirement to wear gloves during manual tasks.

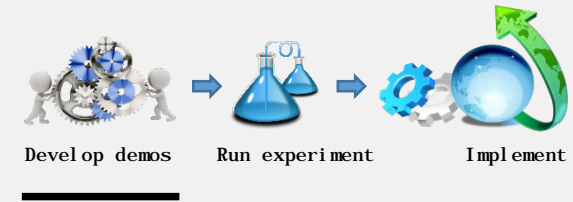
At ConocoPhillips, our work is never so urgent or important that we cannot take time to do it safely and in an environmentally prudent manner.

Here is an example.





Medically accurate.

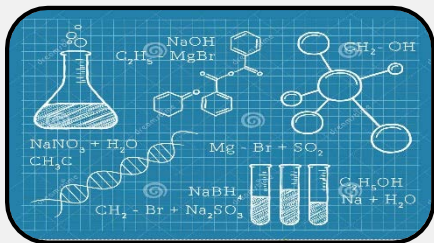


Material: Addition-cure silicone rubber with liquid PVC and latex additive

Key Properties (measured 7 days after cure):

<u>Fabricated Hand</u>		<u>Actual Human Hand</u>
Specific Gravity:	1.07 g/cc	1.067 g/cc
Hardness:	10A	10A
Tensile Strength:	475 psi	421 psi
Elongation at tear:	364%	245%
Die B tear strength:	102 pli	100 pli
Shrinkage:	<0.001 in/in	<0.001 in/in

Step 1: We need a hyper-realistic hand
...Easier said than done



Grounded in science

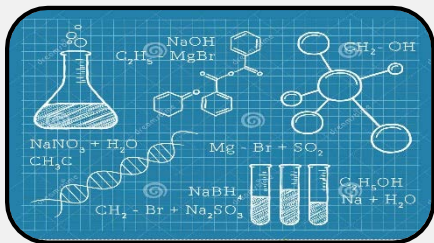


The severity of the injury is related to:

1. How heavy?
 2. How fast?
 3. How sharp?
- } Potential energy → Momentum → Force
 } Contact area → pressure

Pressure is dangerous.

Step 2: Explain simple scientific principles



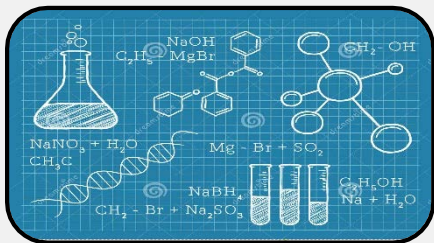
Grounded in science



VS



Step 2: Explain simple scientific principles



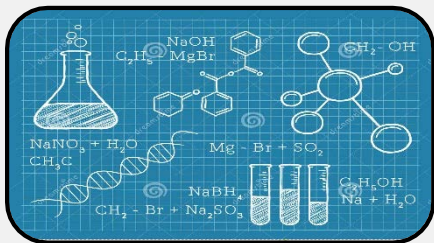
Grounded in science



VS



Step 2: Explain simple scientific principles



Grounded in science



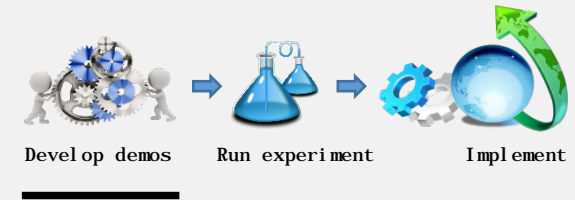
VS



Step 2: Explain simple scientific principles



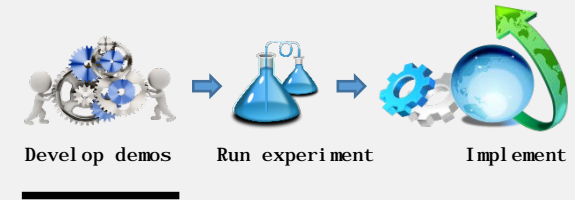
Engaging delivery



Step 3: Make the delivery engaging.



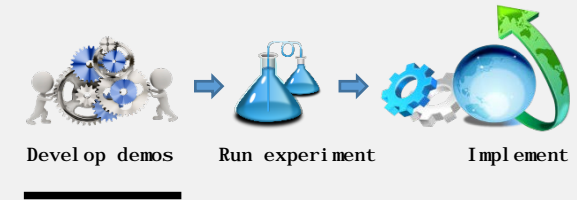
Engaging delivery



Step 3: Make the delivery engaging.



Engaging delivery



Step 3: Make the delivery engaging.



Develop demos



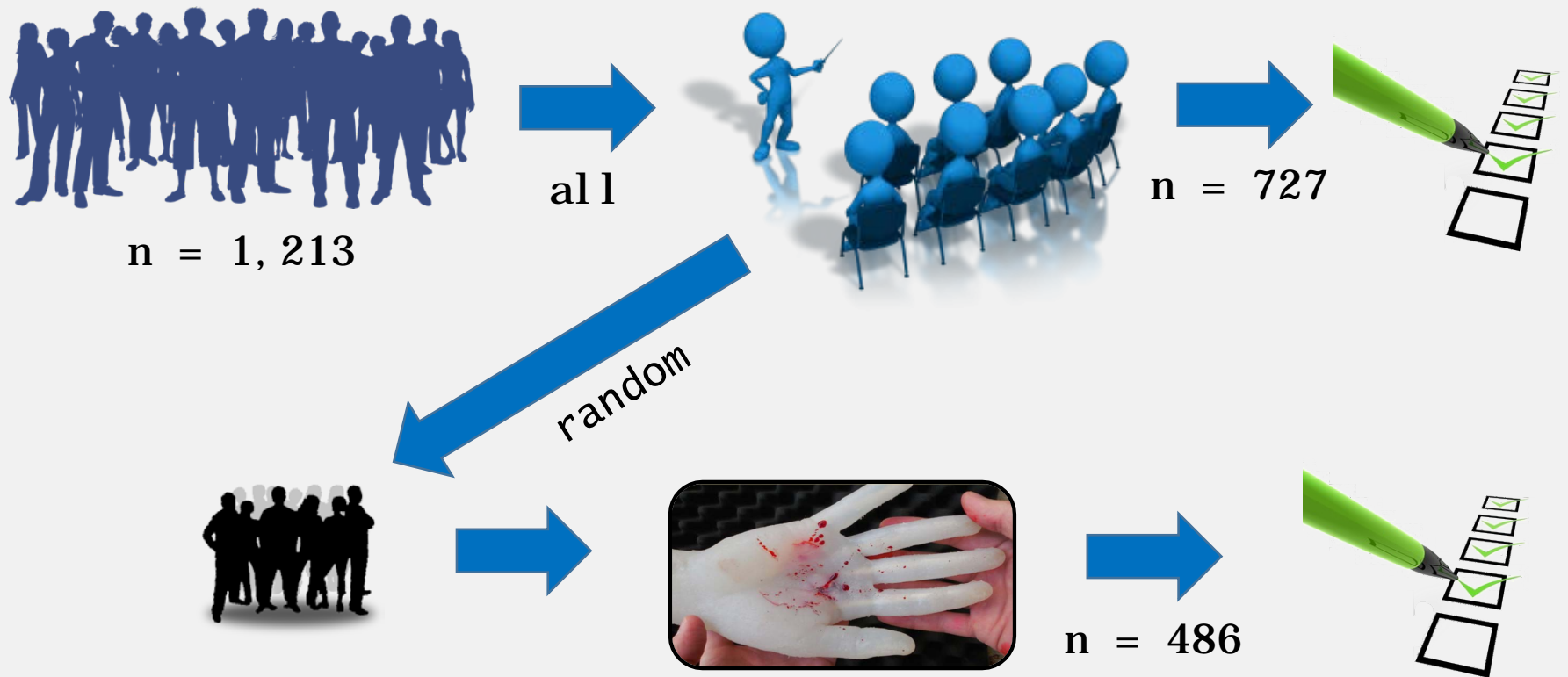
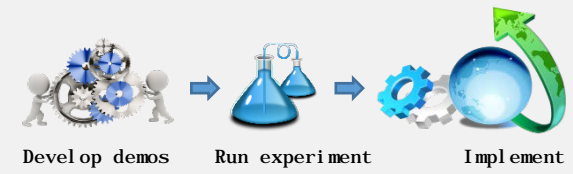
Run experiment



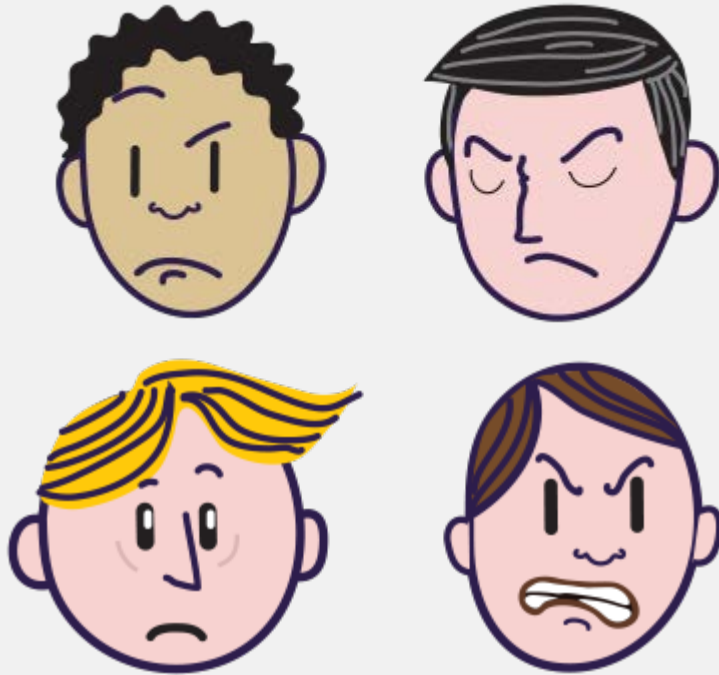
Implement solutions



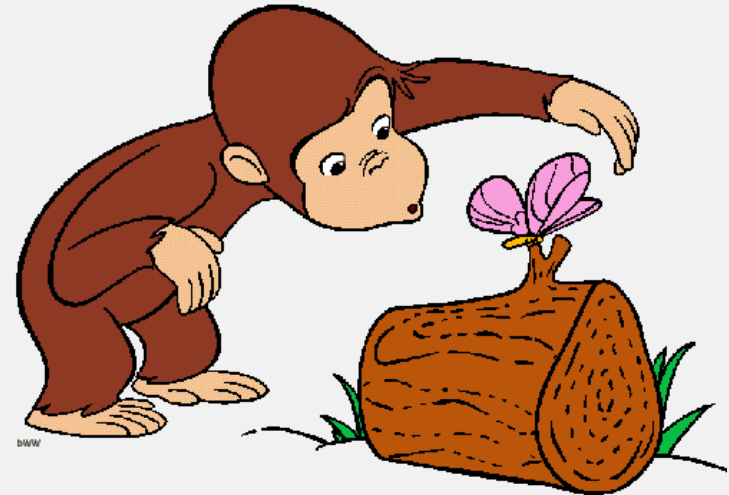
Once developed, we scientifically tested the impacts



Our experimental design.

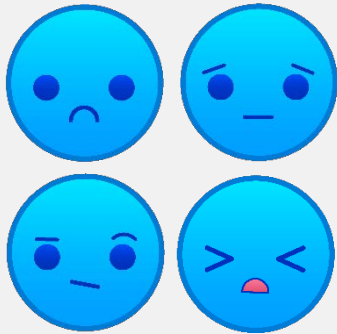
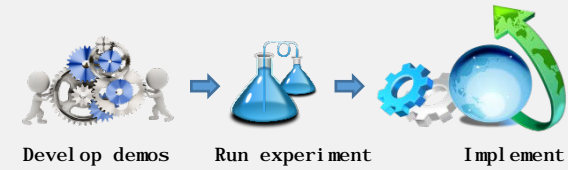


Emotion



Situational Interest

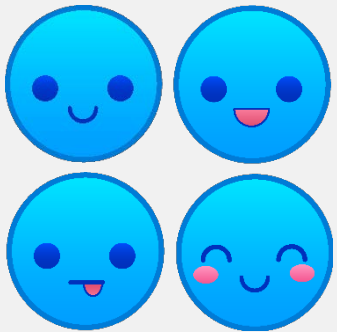
What did we study?



Pessimism, less risk taking, More
motivation to learn

(Öhman and Mineka 2001; Clore et. al. 1994; Keller
et. al. 2006)

Negative emotions

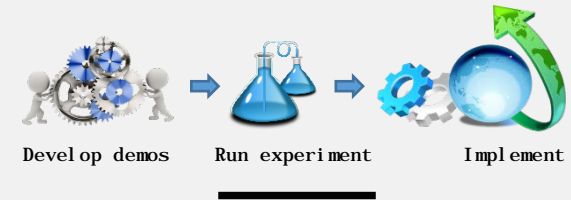


Sense of security, more risk
taking

(Gruber et al. 2011; Taylor and Brown; 1998))

Positive emotions

Why study emotion?



From the fields of educational and applied psychology

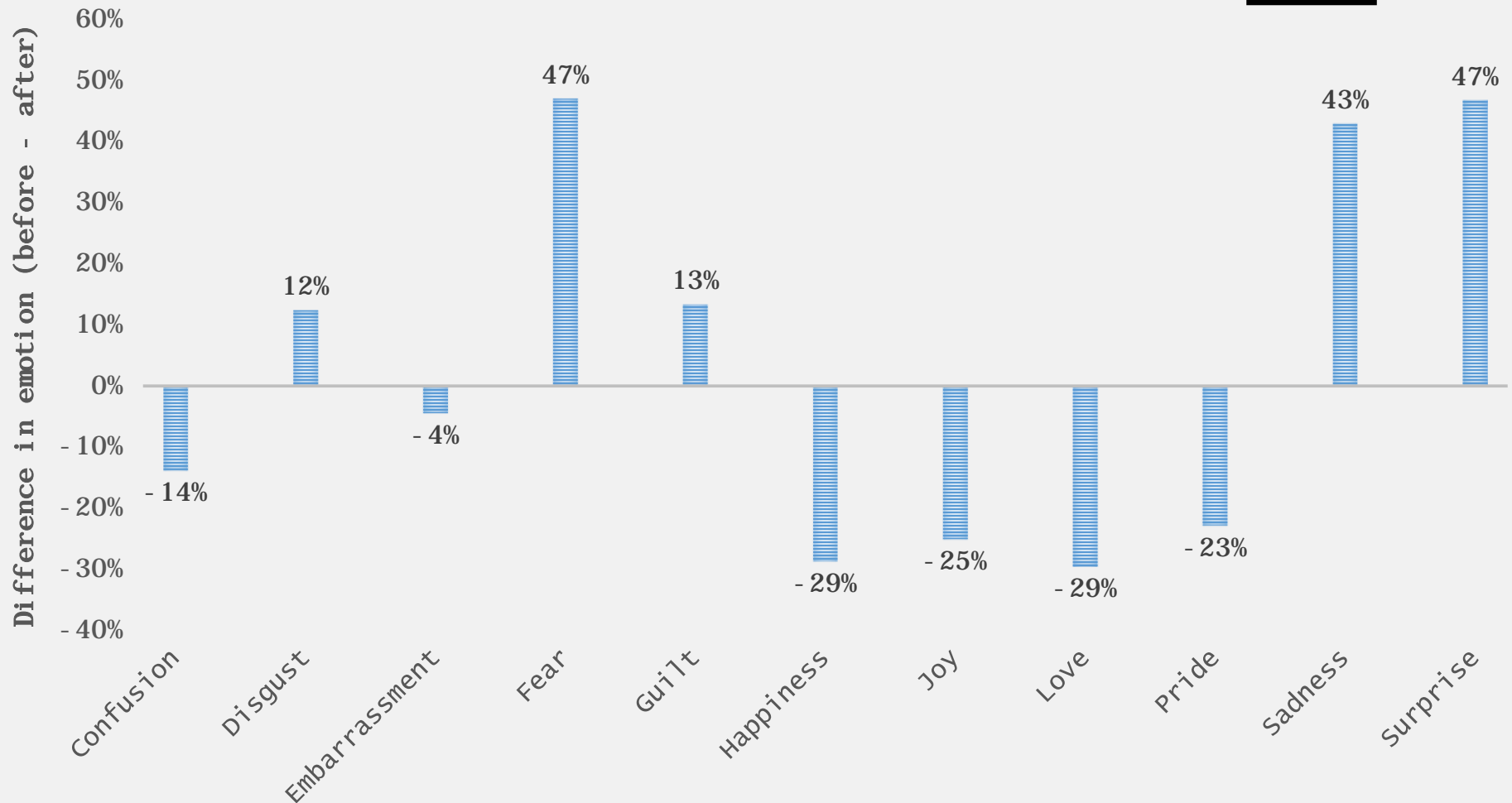
Triggered situational
interest:

“The temporary interest that arises spontaneously due to environmental factors or engaging presentation.”

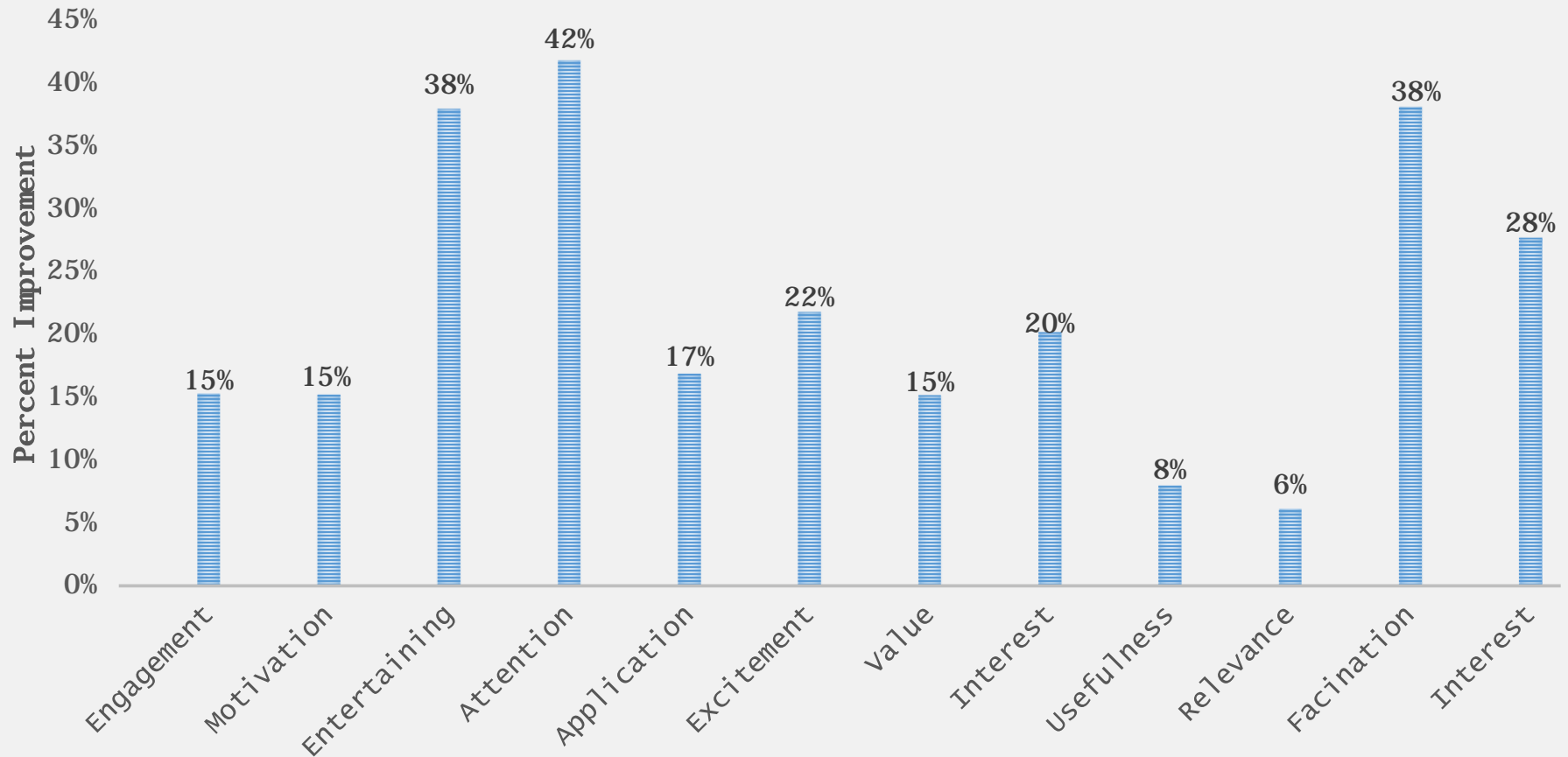
Maintained situational
interest:

“The long-term interest sustained after an engaging experience.”

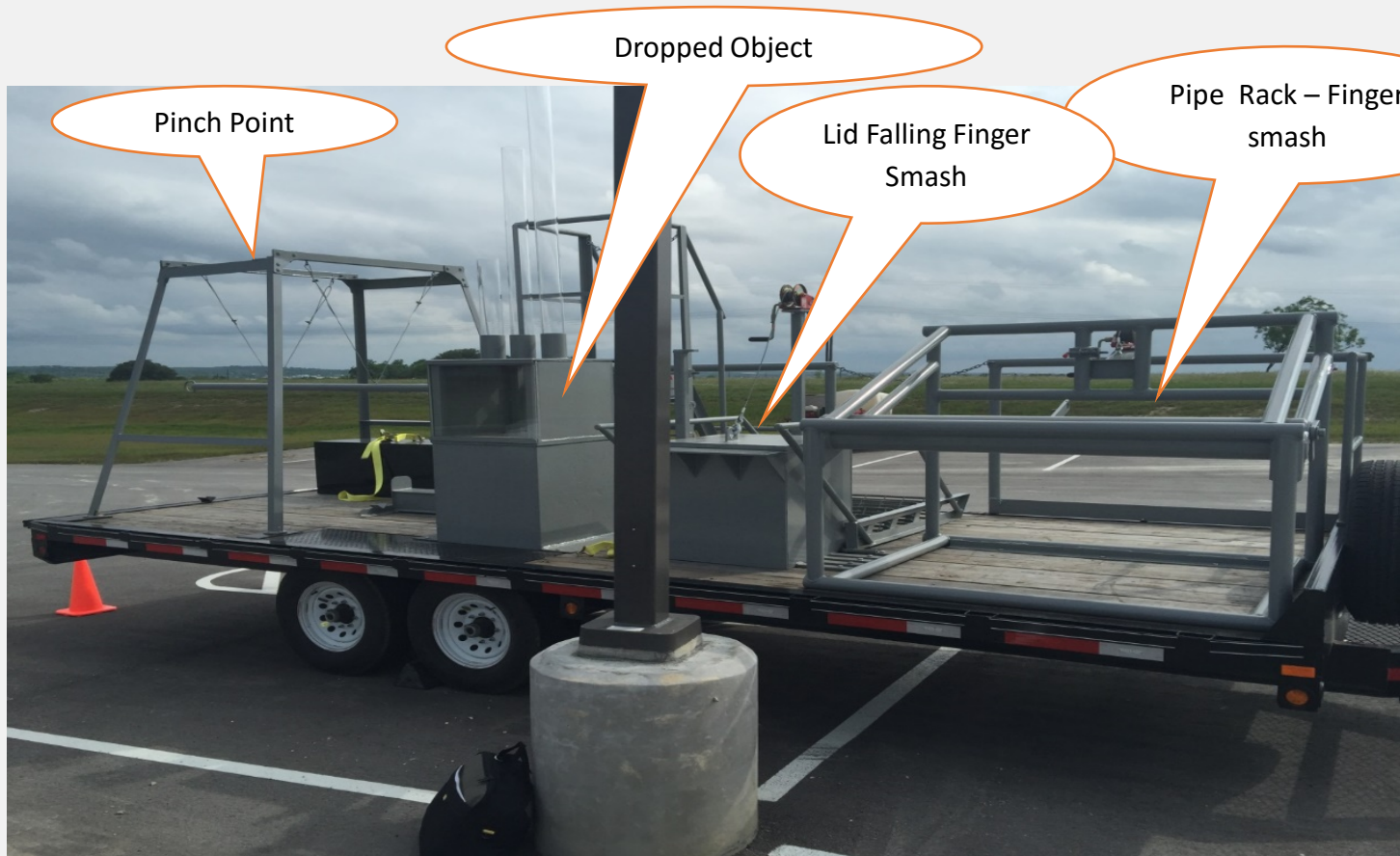
Why situational interest?



Impact of demos on emotional state compared with control group
(p-value < 0.05 only)



Impact of demos on situational interest compared with control
(p-value < 0.05 only)



Implementation

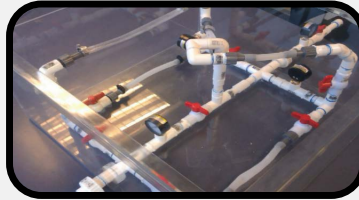


Implementation





Pinch Points



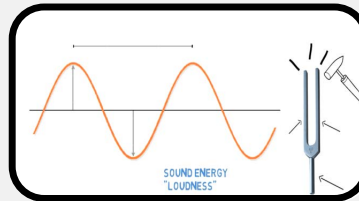
Pipe Pressure



Soil Collapse



Dropped Object



Hearing Loss



Eye Injuries



Box Cutters



Chemical Burns



Work at Height

We now have a suite of demos



www.livesafetydemos.com

Thank you for your time and interest!

Please let me answer your questions.