CONSTRUCTION SAFETY CULTURE SCALE
ITEM GENERATION

Deductive & Subject Matter Expert Approach 52-Items
“Deeply held but often unspoken safety-related beliefs, attitudes, and values that interact with an organization’s systems, practices, people, and leadership to establish norms about how things are done in the organization. Safety culture is a subset of and clearly influenced by, organizational culture. Organizations often have multiple cultures or subcultures, and this may be particularly true in construction.” (NIOSH/CPWR, 2013, p.14)
Based on SME agreement and construct fidelity, we removed 16-items, leaving 36-items for the next scale development phase.

The SME’s reviewed each question and rated the relevance to construction safety culture on a 5-point scale. They also were provided an opportunity to add items to the scale.

5 Industry
Subject
Matter
Experts were Consulted.
SCALE DEVELOPMENT

36 Items.
2 Scale Types

+ Short Answer

Frequency (0-100%)

"Indicate, on average, how often each statement occurs from 0% (never) to 100% (Always) in your workplace.

Agreement (5-point scale)

When imagining your current job and employer, please indicate the extent to which you agree or disagree with each of the follow statements.
Validated with 223 Construction Employees

223 construction employees (supervisors and labour) from a variety of sub-industries while attending a training session at Nova Scotia Construction Safety.

Sub-Industries:

- Commercial Construction
- Concrete & Cement Products
- Concrete Services
- Construction Infrastructure
- Electrical Services
- Framing
- Heavy Construction
- Interior Finishing Services
- Masonry Insulation and Siding
- Misc Maintenance & Install
- Plumbing & Air Conditioning
- Residential Construction
- Roofing
- Site Work
- Wrecking & Demolition
SCALE CONSTRUCTS

3-Factor Solution
Principle Components Analysis: 3 - Factor Solution: 16 - Items

The Scree Plot is used to identify how many factors exist in the scale. It is clear that there is a 3-factor solution from the scree plot and Eigenvalues (greater than 1).
<table>
<thead>
<tr>
<th>Statement</th>
<th>Supervisor Culture</th>
<th>Coworker Culture</th>
<th>Communication Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1My direct supervisor is quick to resolve safety issues on the job site.</td>
<td>.934</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1My direct supervisor leads by example when it comes to safety.</td>
<td>.883</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1My direct supervisor focuses on working safety, even if work will fall behind schedule.</td>
<td>.874</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1My direct supervisor listens to my safety concerns and suggestions.</td>
<td>.832</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1My direct supervisor provides the appropriate amount of discipline when a safety rule or procedure has been broken.</td>
<td>.788</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1My direct supervisor prioritizes safety over everything else.</td>
<td>.727</td>
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<td></td>
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<tr>
<td>1My supervisor is open to new ideas and ways of completing the job in a safer way.</td>
<td>.568</td>
<td></td>
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<tr>
<td>2My coworkers always follow safety rules and regulations.</td>
<td></td>
<td>.848</td>
<td></td>
</tr>
<tr>
<td>2My coworkers care about my safety when we are working together.</td>
<td></td>
<td>.838</td>
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<tr>
<td>2How involved are your coworkers in the decisions regarding their health and safety at work?</td>
<td></td>
<td>.794</td>
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</tr>
<tr>
<td>2How often do your coworkers follow safety rules and procedures?</td>
<td></td>
<td>.772</td>
<td></td>
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<tr>
<td>2How often do your coworkers receive positive feedback when acting safely.</td>
<td></td>
<td>.536</td>
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<tr>
<td>3If I saw something dangerous or unsafe condition, I would talk to my coworkers about it.</td>
<td></td>
<td>.844</td>
<td></td>
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<tr>
<td>3If I saw a dangerous or unsafe condition, I would talk to my supervisor about it.</td>
<td></td>
<td>.842</td>
<td></td>
</tr>
<tr>
<td>3I let my coworkers know when they are not working safely.</td>
<td></td>
<td>.758</td>
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<tr>
<td>3I feel comfortable reporting safety concerns, even if it means the job will be delayed.</td>
<td></td>
<td>.517</td>
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</table>
Factors + Short Answer

**Supervisor Culture:** A supervisor’s support towards safety has consistently been identified as one of the key drivers to a strong and positive safety culture. The selection of items represent a strong safety leader. Someone that leads by example, is receptive to individual safety concerns, and prioritizes safety.

**Coworker Culture:** How you perceive your coworkers can have an important role in identifying underlying aspects of safety culture and can reduce socially desirable responding.

**Communication Culture:** The items assess a clear and uninhibited communication, which is core to a strong and positive safety culture.

1. My direct supervisor is quick to resolve safety issues on the job site.
2. My direct supervisor leads by example when it comes to safety.
3. My direct supervisor focuses on working safety even if work will fall behind schedule.
4. My direct supervisor listens to my safety concerns and suggestions.
5. My direct supervisor provides the appropriate amount of discipline when a safety rule or procedure has been broken.
7. My supervisor is open to new ideas and ways of completing the job in a safer way.
8. My coworkers always follow safety rules and regulations.
9. My coworkers care about my safety when we are working together.
10. How involved are your coworkers in the decisions regarding their health and safety at work?
11. How often do your coworkers follow safety rules and procedures?
12. How often do your coworkers receive positive feedback when acting safely?
13. If I saw something dangerous or unsafe condition. I would talk to my coworkers about it.
14. If I saw a dangerous or unsafe condition. I would talk to my supervisor about it.
15. I let my coworkers know when they are not working safely.
16. I feel comfortable reporting safety concerns, even if it means the job will be delayed.
RELIABILITY ANALYSIS

Cronbach’s Alpha
Cronbach’s Alpha is a reliability indicator of internal consistency.

An acceptable Cronbach’s Alpha values range between .70 and 1.0

### Supervisor

<table>
<thead>
<tr>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
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<tbody>
<tr>
<td>.934</td>
<td>.937</td>
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<td>7</td>
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### Coworker

<table>
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<td>.816</td>
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### Communication

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<td>.812</td>
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SCALE EVALUATION

Phase I
Phase II underway
Safety Culture Scale Relationships

Our Construction Safety Culture Scale was correlated with several safety performance scales, climate scale, and self-reported safety injury and events.

Safety Performance was measured by 4-constructs. Safety Knowledge, Safety Motivation, Safety Compliance, and Safety Participation. Self-report injuries and safety events

Safety Climate

Safety knowledge, which refers to the amount of knowledge an employee has regarding safe work practices.

Safety motivation, which refers to an employees attitude towards the importance of safety.

Safety Participation, refers to an employees effort in contributing to the safety in the workplace.

Safety compliance, which refers to an employees ability to follow rules related to safety.
### Correlations

<table>
<thead>
<tr>
<th></th>
<th>Climate</th>
<th>Knowledge</th>
<th>Compliance</th>
<th>Participation</th>
<th>Motivation</th>
<th>Mean Injury</th>
<th>Self-Report Safety Events</th>
<th>Self-Report Safety Injuries</th>
<th>Supervisor</th>
<th>Coworker</th>
<th>Communication</th>
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</table>

**Safety climate**
1. Management places a strong emphasis on workplace health and safety
2. Safety is given a high priority by management
3. Management considers safety to be important

**Safety compliance**
1. I use all the necessary safety equipment to do my job
2. I use the correct safety procedures for carrying out my job
3. I ensure the highest levels of safety when I carry out my job

**Safety participation**
1. I promote the safety program within the organization
2. I put in extra effort to improve the safety of the workplace
3. I voluntarily carry out tasks or activities that help to improve workplace safety

**Safety motivation**
1. I feel that it is worthwhile to put in effort to maintain or improve my personal safety
2. I feel that it is important to maintain safety at all times
3. I believe that it is important to reduce the risk of accidents and incidents in the workplace

**Safety knowledge** (Neal, Griffin, & Hart, 2000; Griffin & Neal, 2000)
1. I know how to perform my job in a safe manner
2. I know how to maintain or improve workplace health and safety
3. I understand the health and safety regulations relating to my work