

Industrial Construction Company: Safety Assessment Research

The following is a summary of the results of the analysis examining the effectiveness of the TalentClick Safety Quotient (SQ) Assessment for use by COMPANY. The data analysis was performed by Rand Gottschalk, MA (Industrial Psychology). Mr. Gottschalk completed the work of the late Dr. Rick Iverson, who had partially completed the analysis earlier this year.*

Mr. Gottschalk is a psychometric assessment specialist residing in Lansing, Michigan. His work has encompassed various industries including automotive, software, metal, raw material, consumer products, and service. Some of his clients have included Ford Motor Company, Alcoa, Saturn Corporation, KB Homes, Pepsi Bottling Group, Chrysler, the American Medical Association, and the US Department of Justice. During the course of his 25-year consulting career, he has specialized in the development, validation, and implementation of assessment tools in industry. He has been involved in the development, validation, and implementation of various types of tests including physical, cognitive, and personality as well as structured interviews and assessment center exercises. Rand holds a Master of Arts in Industrial Psychology from Michigan State University.

FINDINGS

25-50%
Reduction in average
personal incident rate

\$76,000
Average savings for
100 hires

*COMPANY refers to the Industrial Construction Company that is the subject of this study, whose name is left anonymous upon the client's request.

Please contact Talent-Click at 1.877.SAFE.778 to request references via phone.

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PEOPLE
REDUCE
RISK

Highlights of Findings

The data analysis involved examining the relationships between the SQ assessment data and the safety incident data through statistical analyses.

The strongest relationships found in the data analysis are:

“Resistant”

Linked to Crew Recordable Injuries:

A Foreman’s or Field Superintendent’s “Resistant” score (the tendency to disregard rules) is significantly correlated with Crew First Aid Incidents ($r = .26, p < .01, n = 115$). This means the higher the Foreman’s or Field Superintendent’s “Resistant” score, the higher the risk of a crew member first aid incident.

Foremen or Field Superintendents scoring in the high risk range of Resistant had an average incident rate 2.3 times higher than that those who scored in the low and average risk ranges.

“Irritable”

Linked to Crew Recordable Injuries:

A Foreman’s or Field Superintendent’s “Irritable” score (the tendency to become annoyed with others and have a negative emotional reaction to stress) is significantly correlated with Crew Recordable Injuries ($r = .24, p < .01, n = 115$). This means the higher the Foreman’s or Field Superintendent’s “Irritable” score, the higher the risk of a crew member recordable injury.

“Impulsive”

Linked to Personal Injuries:

A field worker’s “Impulsive” score (the tendency to take risks and act without fully considering the consequences) is significantly correlated with Personal Injuries (First Aid, Recordable Injuries, Clinic Visits for him/her personally) ($r = .15, p < .01, n = 476$). This means the higher the worker’s “Impulsive” score, the higher the risk of a personal injury.

Those scoring in the high risk range of Impulsive had an average incident rate 5 times higher than that those who scored in the low and average risk ranges.

“Thrill-Seeking”

Linked to Personal Recordable Injuries:

A field worker’s “Thrill Seeking” score (the tendency to seek excitement) is significantly correlated with Personal Recordable Injuries (First Aid, Recordable Injuries, Clinic Visits for him/her personally) ($r = .19, p < .01, n = 476$). This means the higher the worker’s “Thrill Seeking” score, the higher the risk of a personal recordable injury.

Background

The Safety Quotient (SQ) Assessment

The SQ is a behavioral assessment developed and validated with North American working adults in industrial settings. It measures the key personality traits related to safety behaviors in the workplace. It is trusted by employers such as CN Rail, Ledcor, Lafarge, Kiewit, Finning, and Emeco, to assess candidates and current employees. The SQ helps them identify and address potential risks within workers' "default behaviors" that may lead to human error on the job.

The SQ is recommended to be used as "one piece of the safety puzzle" to provide employers and employees with insight into potential safety risks on an individual-person basis. The SQ complements but does not replace best practices in training, equipment, and processes/procedures that should also be implemented and maintained.

The SQ is customizable, meaning that it can be tailored on a client-by-client basis. The recommended approach to its use, and the one COMPANY elected to take is to begin using the standard version of the SQ and to conduct a research project to determine the personality characteristics that are most strongly linked to safety outcomes in their unique environment. Based on the findings of the research project, the SQ can be tailored to improve its accuracy in predicting safety-related outcomes.

Two Types of Reports

For Employers:

Helps hiring managers or supervisors predict risk & provides interview tips to probe "higher-risk" areas

For Self-Coaching:

Helps a person be more aware of their own personal safety risk factors and how to reduce their impact



The 5 Factors

The standard version of the SQ measures the following safety-related personality characteristics:

Resistant: High risk individuals may disregard authority and rules and be resistant to feedback. Low risk individuals tend to willingly follow guidelines, follow training and are compliant with rules.

Nervous: High risk individuals may panic or freeze when faced with unexpected safety-sensitive situations, and may feel unsure about their abilities. Low risk individuals tend to be confident and are steady and calm under pressure.

Irritable: High risk individuals may become annoyed by others especially when under stress. Low risk individuals tend to be less irritable and are easily able to control their emotions when under stress.

Restless: High risk individuals seek stimulation and variety, and may be easily distracted. Low risk individuals are less likely to seek stimulation and are able to stay focused and alert.

Impulsive: High risk individuals tend to seek excitement, enjoy taking risks and may underestimate possible negative consequences of their actions. Low risk individuals do not seek excitement and tend to carefully evaluate their options before making decisions.

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Data Analysis Process & Results

The following data was analyzed:

The Safety Quotient (SQ) results for 645 COMPANY employees collected between December 2011 to May 2012.

Existing safety incident data from January 2011 to May 2012 involving any of these 645 employees was collected by COMPANY and submitted to TalentClick for the analysis. The data contained:

71 Personal Incidents

a person was involved in an incident him/herself

- o First Aid
- o Clinic Visit No Treatment
- o Recordable Injury
- o Near Misses
- o Property Damage
- o Equipment Damage

197 Crew Incidents

a foreman or field superintendent had a member of his/her crew involved in an incident

- o First Aid
- o Clinic Visit No Treatment
- o Recordable Injury
- o Near Misses
- o Property Damage
- o Equipment Damage

Notable Issues Related to the Data Analysis

- The analysis revealed many personality factors linked to safety incidents that should be examined with more incident data. Compared to analyses conducted with other organizations though, there were relatively few safety incidents we could use in the analysis that involved employees who had also completed the SQ assessment. For example, many safety incidents from 2011 involved employees who had not completed the assessment so we were unable to include those incidents in the analysis. Also, for many categories of incidents, there were less than 10 incidents of that type so some categories of incidents were aggregated to provide meaningful incident variables.

We would expect to have a much more robust data set at the end of 2012 having assessed the entire current workforce (approximately 1000 employees) and having additional incident data from May 2012 to December 2012.

- Data from “Non-Field” roles such as “Off-Site Staff” were removed from the data set to better represent the safety-sensitive roles that the project is focused on.
- We were unable to separate Froth and Mod Yard data in the analysis because of the relatively small number of incidents. We would likely be able to do this in the next analysis at the end of 2012.

Detailed Data Analysis Findings

First, using the standard TalentClick Safety Quotient assessment results, the following factors show statistically significant correlations:

Personal Incidents (Field Workers)

"Impulsive" Linked to Personal Injuries:

A field worker's "Impulsive" score (the tendency to take risks and act without fully considering the consequences) is significantly correlated with Personal Injuries (First Aid, Recordable Injuries, Clinic Visits for him/her personally) ($r = .15$, $p < .01$, $n = 476$). This means the higher the worker's "Impulsive" score, the higher the risk of a personal injury.

Those scoring in the high risk range of Impulsive had an average incident rate 5 times higher than that those who scores in the low and average risk ranges.

Crew Incidents (Foremen and Field Supervisors)

"Irritable" Linked to Crew Recordable Injuries:

A Foreman's or Field Superintendent's "Irritable" score (the tendency to become annoyed with others and have a negative emotional reaction to stress) is significantly correlated with Crew Recordable Injuries ($r = .24$, $p < .01$, $n = 115$). This means the higher the Foreman's or Field Superintendent's "Irritable" score, the higher the risk of a crew member recordable injury.

"Nervous" Linked to Crew Recordable Injuries:

A Foreman's or Field Superintendent's "Irritable" score (the tendency to become annoyed with others and have a negative emotional reaction to stress) is significantly correlated with Crew Recordable Injuries ($r = .24$, $p < .01$, $n = 115$). This means the higher the Foreman's or Field Superintendent's "Irritable" score, the higher the risk of a crew member recordable injury.

Detailed Data Analysis Findings (Cont'd)

Second, a further factor analysis was conducted to tailor the areas the assessment measures based on the collected COMPANY data, supplemented with the data from an additional 600 front-line workers. This resulted in slight variations of the areas or “factors” measured by the assessment and the changes to the formulas used to calculate the scores. The following tailored factors also show statistically significant correlations:

Personal Incidents

(Field Workers)

“Thrill-Seeking” Linked to Personal Recordable Injuries:

A field worker’s “Thrill Seeking” score (the tendency to seek excitement) is significantly correlated with Personal Recordable Injuries (First Aid, Recordable Injuries, Clinic Visits for him/her personally) ($r = .19, p < .01, n = 476$). This means the higher the worker’s “Thrill Seeking” score, the higher the risk of a personal recordable injury.

A field worker’s “Thrill Seeking” score (the tendency to seek excitement) is significantly correlated with Near Misses ($r = .10, p < .03, n = 476$). This means the higher the worker’s “Thrill-Seeking” score, the higher the risk of him/her having a near miss incident.

“Impulsive” Linked to Personal Recordable Injuries:

A field worker’s “Impulsive” score (the tendency to take risks and act without fully considering the consequences) is significantly correlated with Equipment and Property Damage ($r = .11, p < .02, n = 476$). This means the higher the worker’s “Impulsive” score, the higher the risk of him/her having a property damage incident.

“Reactive” Linked to Personal Recordable Injuries:

A field worker’s “Reactive” score (the tendency to have a negative emotional reaction to

Crew Incidents (Foremen and Field Supervisors)

“Resistant” Linked to Crew Recordable Injuries:

A Foreman’s or Field Superintendent’s “Resistant” score (the tendency to disregard rules) is significantly correlated with Crew First Aid Incidents ($r = .26, p < .01, n = 115$). This means the higher the person’s “Resistant” score, the higher the risk of a crew member first aid incident.

Foremen or Field Superintendents scoring in the high risk range of Resistant had an average incident rate 2.3 times higher than that those who scored in the low and average risk ranges.

“Reactive” Linked to Crew Recordable Injuries:

A Foreman’s or Field Superintendent’s “Reactive” score (the tendency to have a negative emotional reaction to stress) is significantly correlated with Crew Recordable Injuries ($r = .24, p < .01, n = 115$). This means the higher the person’s “Reactive” score, the higher the risk of a crew member recordable injury.

“Impulsive” Linked to Crew Recordable Injuries:

A Foreman’s or Field Superintendent’s “Impulsive” score (the tendency to take risks and act without fully considering the consequences) is significantly correlated with Crew Recordable Injuries ($r = .21, p < .02, n = 115$). This means the higher the person’s “Impulsive”

Detailed Data Analysis Findings (Cont'd)

stress) is significantly correlated with Personal Recordable Injuries ($r = .09$, $p < .05$, $n = 476$). This means the higher the worker's "Reactive" score, the higher the risk of a personal recordable injury.

"Resistant" Linked to Personal Recordable Injuries:

A field worker's "Resistant" score (the tendency to disregard rules) is significantly correlated with Personal Recordable Injuries ($r = .09$, $p < .05$, $n = 476$). This means the higher the worker's "Resistant" score, the higher the risk of a personal recordable injury.

score, the higher the risk of a crew member recordable injury

Notable Client Feedback Collected During the Project:

- Multiple requests were made to reduce the length assessment by reducing its number of questions. This is possible now that the initial data analysis is complete. See below for related recommendations.
- Support for paper-based assessments was requested for assessing external candidates at the medical screening partner locations (SureHire). TalentClick provided the ability for paper versions of the completed assessment to be faxed in for processing.
- Multiple language support for assessment-takers was requested. TalentClick provided its French and Spanish versions of the assessment and also translated it into Portuguese and Polish as requested by COMPANY.
- Some employees were suspicious of how the data from the assessment would be used. Clarification of the purpose and method of the project was re-stated in Foreman training sessions provided by TalentClick.

Applying the Findings

Reducing Incidents by Improving Employee Selection

Based on the findings of this data analysis, the tailored assessment can be used for selection of new employees to “red-flag” extreme high risk individuals resulting in the following improvements to safety outcomes:

A) Example:

Using the most important factor identified for field worker positions, candidates who score in the highest 25% on the “Impulsive” score could be “red-flagged”.

“Screening-In”:

Hiring 100 candidates using this as a guideline would result in *2 fewer personal injuries* than if this guideline was not used.

“Screening-Out”:

Not hiring 100 candidates using this as a guideline would result in *8 fewer personal injuries* than if this guideline was not used.

B) Example:

Using the most important factor identified for supervisory (Foremen and Field Superintendent) roles, candidates who score in the highest 25% on the “Resistant” score could be “red-flagged”.

“Screening-In”:

Hiring 100 candidates using this as a guideline would result in *4 fewer crew first aid incidents* than if this guideline was not used.

“Screening-Out”:

Not hiring 100 candidates using this as a guideline would result in *15 fewer crew first aid incidents* than if this guideline was not used.

Note: The restrictiveness of the criteria is for “Red-Flagging” candidates can be adjusted based on a number of the factors identified as significant, depending on COMPANY’s preferences. The options related to this should be discussed.

Recommendations for Moving Forward

1. Keep Using the Safety Quotient (SQ)

Continue to assess all new hires using the tailored assessment. The tailored assessment results more closely reflect the safety behaviors and incidents specific to COMPANY.

The length of the assessment can be reduced from 237 questions to approximately 100-120 questions if the tailored version is used going forward.

Report formats can be refined to reflect the adjustments to the areas measured and “Red-Flagged” of extreme scores, if desired. Options related to this should be discussed.

2. Use Self-Coaching Reports

Continue to provide the Self-Coaching reports for encouraging employees to learn and become aware of their own personal risk factors.

3. Repeat Data Analysis

We strongly recommend a second data analysis to be performed at the end of 2012 incorporating data from all of 2011 and 2012 including new hire and candidate data. This would produce more robust results and further insights into the risk factors of new hires. TalentClick would conduct this analysis at no extra cost to COMPANY.