

# WHAT YOU DON'T KNOW CAN HURT YOU

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## EXECUTIVE SUMMARY

The rate of serious injuries and fatalities in the workplace has not declined as fast as minor injury rates. Much of this is because safety training programs assume that all employees react the same. New research shows that incorporating personal factors, or a person's "safety DNA," into workforce training and hiring can reduce your organization's injury rate dramatically.



Despite great progress in workplace safety and a steady reduction in injury rates over the past few decades, we are seeing an alarming trend across many industries. As outlined by Fred Manuele last year in “Preventing Serious Injuries and Fatalities,” while minor injury rates have continued to decrease since 2006, serious injuries and fatalities have plateaued. These findings are contrary to what we would expect based on the traditional theory that reductions in exposures and minor injuries lead to similar reductions in serious injuries and fatalities. Thus, advances in engineering, systems, training and processes should have led to significant improvements in both metrics.

However, is it possible that these traditional approaches have taken us as far as we can go? Is there a missing piece that could help organizations close the gap in reaching their goal of zero incidents?

Most organizations focus on reducing workplace injuries and fatalities by improving safety training programs, providing safe working conditions and implementing clear policies and procedures. While these approaches are important, their effectiveness relies on the assumption that all individuals are inherently and equally safe, and that training, environmental factors and policies will lead to everyone working safely. However, research tells us that this is not the case. Certain individuals are more likely to expose themselves and others to risk and to engage in at-risk behaviors.

This should come as no surprise. We see individual differences in ability, attitude and performance everywhere, whether it’s work, sports or family. More importantly, nearly a century of published research from the field of industrial and organizational psychology documents widespread differences in individual characteristics, from personality traits to attitudes to physical and mental abilities and aptitudes. This is why not everyone can be a successful salesperson, maintenance technician or professional athlete.

The same principle applies to safe behavior in the workplace. Why would we expect every employee to respond

equally well to training courses, perceive the same level of risk across situations, or react to policies and procedures in the same manner? Yet organizations largely overlook the vital role of the individual when they train everyone in the same way and when they hire new employees without screening for risk propensity.

Are there individual characteristics that predispose someone to avoid risk and work in a safer manner? The answer is yes, and we can refer to these characteristics as “safety DNA.”

### Safety DNA

Safety DNA refers to individual traits, abilities and attitudes strongly associated with personal exposure and injury risk. In a sense, the emergence of safety DNA simply confirms what we have known intuitively for a long time – certain individuals are more prone to at-risk behavior and injuries than others.

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**Certain individuals are more prone to at-risk behavior and injuries than others.**

Researchers long have sought to discover the psychological traits related to injury likelihood. Up until recently, it was thought that we could not really predict safe behavior using measures of psychological traits. However, a growing body of evidence shows that certain characteristics consistently predict safety outcomes. The challenge has been to integrate this research, which has focused on multiple factors and different methodologies, into a coherent model.

Over the past five years, researchers at Select International have put all of these elements together into a set of four personal-level factors that lie behind nearly all safety incidents and injuries. The following four factors constitute the 4 Factor S.A.F.E. Model.

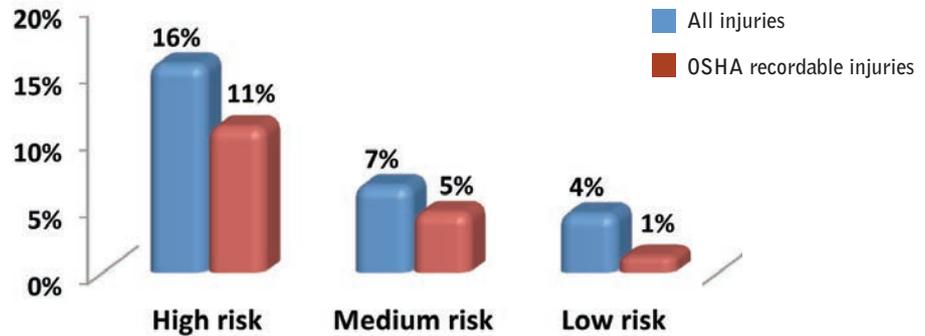
1. Stays in control: This first factor relates personal and emotional control. People who are high on this factor believe that they possess a high level of control over the things that happen to them. They think that their actions can have an effect on their current situation. In addition, these individuals can stay in control of their emotions and remain calm and collected during challenging

situations. For this reason, this factor often comes into play when they are under stress. Decision-making and actions often are quite different under normal versus stressful conditions. Individuals who stay in control tend to engage in safer behavior because they feel personal ownership of their own safety and because they can control their emotions when the pressure is on.

2. **Aware of surroundings:** This second factor consists of various abilities related to a person's overall awareness. Some individuals are keenly aware of their immediate environment and can maintain their focus more easily than others. As a result, they notice and avoid potential hazards and dangers. This factor also includes memory and recall ability. As such, people high on awareness often are described as having a "photographic" memory and usually possess a high attention to detail. Together, these abilities form an overall factor that influences their ability to remain vigilant over time, to notice potential hazards, and to remember vital information that can help them sense and avoid risks.
3. **Follows rules:** The third factor in the model deals with the likelihood that an individual will follow versus break rules and policies. People vary greatly when it comes to their level of respect toward rules. Rule-bound individuals naturally want to adhere to established rules, and they get a general sense of security from knowing that there is "a correct" way to do something. They also tend to be diligent and enjoy structure in their environment. In contrast, those who are lower on this factor have a desire to question rules or assumptions frequently. They often perceive rules to be mere "guidelines" that they can choose to follow depending on the situation. As a result, they tend to be creative problem solvers who can think in innovative ways. However, this tendency to question, bend or even break the rules can lead to injury in environments that have inherent risks.

## RISK FACTORS CORRELATE WITH INJURIES

Figure 1. Percentage of employees injured by safety risk score. Current workers with higher risk scores were more likely to be involved in safety incidents.



4. **Exhibits caution:** The final factor, exhibits caution, comprises two main psychological traits that are linked closely to at-risk behavior. The first is thrill-seeking or sensation-seeking, which determines an individual's overall comfort level with risk. Highly cautious people perceive more risk in everyday activities and are uncomfortable taking unnecessary chances. The second trait included in this factor is impulsivity. Impulsive individuals tend to take action quickly without considering the potential consequences of their behavior, and they are more likely to behave in volatile and unpredictable ways. The combination of thrill-seeking and impulsivity predisposes some individuals to engage in at-risk behaviors and poor decision-making, which in many situations increases their exposure to injury.

### Research evidence

While it is one thing to identify these factors and their specific components theoretically, it is another thing altogether to measure them in a valid manner and use that information to predict safety outcomes. In 2012, researchers at Select International created a psychological assessment designed to measure all of these factors. As part of a rigorous validation process, the assessment was administered to 796 employees from three different organizations from various industries: petrochemical, paper products

manufacturing and construction materials manufacturing.

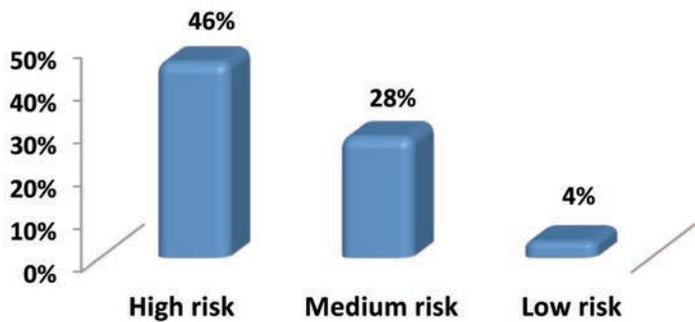
Employees worked in various hourly positions such as production operators, skilled crafts and warehouse personnel. Safety incident and severity data were collected on these individuals over 36 months. Based on their assessment results, employees were categorized into one of three risk groups: low, medium or high. Lower scores on the four factors resulted in a higher risk score.

**People vary greatly when it comes to their level of respect toward rules.**

A total of 179 safety incidents occurred within the sample of 796 employees; 60 of those incidents resulted in an injury and 37 of those injuries were classified as an Occupational Safety and Health Administration (OSHA) recordable injury. Analyses were conducted to determine if there was a significant relationship between assessment scores and incidents. As highlighted in Figure 1, the results were impressive and showed a strong relationship between the risk group classification and injury frequency. Compared to those in the low risk group, individuals in the high risk group were involved in safety incidents four times as often (16 percent compared to 4 percent). Furthermore, the relationship was stronger for more serious injuries (i.e., recordable injuries). Results showed that those in the high risk group (11 percent) were more than 10 times likely to suffer a recordable injury than those in the low risk group (less than 1 percent). In fact, in this sample, nearly half (43

# HIGHER RISK = SERIOUS PAIN

Figure 2. Percentage of incidents resulting in serious injury by safety risk score. Employees with higher risk scores were more likely to be involved in serious injuries.



percent) of the OSHA recordable injuries involved individuals in the high risk group.

The study also looked more closely at incident involvement. Safety incidents do not always result in an injury, as is the case with near misses. To examine how risk scores related to incident severity, the researchers also examined incident involvement within each risk category.

Results showed that when high risk individuals were involved, nearly half of the time (46 percent) it resulted in an OSHA recordable incident. This compared to 28 percent for those in the medium risk group and only 4 percent for those in the low risk group, as illustrated in Figure 2. These results indicate that individuals with a certain safety DNA profile are significantly more at risk of not only being injured on the job, but of suffering a serious, OSHA recordable injury. Despite having similar levels of experience and having gone through the same training and certifications, certain individuals simply display a higher probability of getting injured, and that likelihood can be tied to their safety DNA profile.

## Using safety DNA to improve your organization

Knowing the key psychological factors that underlie safe behavior and having the methodology to measure these factors provide new information that allows organizations to be more proactive about safety. As safety professionals seek to identify new leading indicators (e.g., total hazards identified)

of safety and rely less on lagging indicators (e.g., incident rates), understanding an individual's psychological safety DNA can provide a powerful leading indicator of potential exposure.

For example, individuals who score very low on one or more of the four factors described earlier are more likely than others to place themselves in danger by making poor decisions under pressure, failing to notice hazards, ignoring a safety rule or taking unnecessary risks on the job. A validated measure of their psychological safety DNA can predict this type of at-risk behavior before it occurs, providing an opportunity to avoid an incident. In the context of organizations, this can be accomplished by incorporating this methodology into one of two processes: developing the current workforce and recruiting and selecting employees.

When organizations provide training, it often consists of classroom-style instruction that gives all participants the same content. Obviously, classes or workshops offer a valuable type of learning experience and can be effective, but their success depends on the assumption that all individuals will interpret and react to the experience in the same manner. Research suggests that personal factors such as learning styles or personality traits significantly influence training success across different individuals.

Safety-based training also assumes that participants do not differ greatly in terms of their safety DNA traits.

Employees who have low trait levels of

caution might understand and retain all of the information in a training session about wearing personal protective equipment, but they are less likely to perceive the risk of not wearing their gear. Therefore, these people might not apply the training knowledge consistently. This is one reason why classroom safety training often has mixed results.

One way to address this issue is to make safety training more personal and applicable to the individual. By giving people new insights about themselves, they can understand why they engage in certain behaviors. When it comes to safety, we all have certain blind spots that can put us at risk. A person has a blind spot when they lack adequate insight about themselves with respect to a trait or ability related to safety.

For example, people might think they are aware and possess an excellent memory. However, their actual behavior (e.g., failing to notice signs, forgetfulness) might not be congruent with how they see themselves in this area. As a result, they may believe they are safe drivers and can work safely in a high hazard environment full of suspended loads and moving equipment. But in real life, they fail to notice many potential hazards and frequently put themselves at risk without knowing it. These individuals have blind spots related to the awareness of surroundings factor. In an environment wrought with hazards, it only would be a matter of time before they are involved in a safety incident.

Unfortunately, most employees lack in-depth insight into their safety DNA and do not know what their personal blind spots are. This need not be the case. By using a validated assessment that measures safety DNA and coupling it with an individual feedback and coaching process, organizations can address this critical gap. This process can empower employees with information about their psychological makeup, information that can help them understand risky situations and develop behaviors that can help them overcome or counteract their safety blind spots.

For example, that same individual who

is low on awareness might meet with a trained individual in a one-on-one setting to review the person's safety DNA profile. In this brief meeting, the coach can interpret the results in an accurate manner that is meaningful for the individual. If the individual frequently works at heights (e.g., repairing building roofs), the conversation could surround the importance of frequently checking whether fall protection equipment is secured properly and scanning the area for unprotected edges or holes on a roof.

People with this type of profile are likely to be distracted more easily when they are concentrating on a task and might forget to tie off their safety harness properly or fail to see a hole on the rooftop. Both of these exposures could lead to serious injury or death, and they are significant concerns in industries such as construction. Therefore, they could greatly benefit by identifying some critical behaviors that can help reduce their risk in this area, such as reminding themselves to scan their surroundings every few minutes and going through a brief checklist of precautions whenever they are about to adjust their fall protection equipment.

A skilled coach who has experience in the same line of work can help the individual think of potential exposures, along with behaviors that can have real impact on their everyday safety. The

coach can help the individual identify specific, observable behavioral goals (e.g., "Check my safety harness every 15 minutes") that can be measured, as opposed to vague goals (e.g., "Be more careful").

Behavioral goals can be made easier through the use of memory phrases that employees identify during the session to help them remember the behavior. Furthermore, by identifying an "accountability partner," such as a trusted co-worker, and sharing their behavioral safety goals with this person, opportunities are created for more frequent feedback on at-risk behaviors. If coupled with regular follow-up, this process can provide a robust way to counteract an employee's safety blind spots and reduce their exposure regardless of the time or setting.

Since people take their safety DNA with them everywhere they go, this process provides a highly personalized safety tool that can be used at any time, in any place, regardless of the situation.

The second main avenue where safety DNA can play a major role is through a company's recruitment and selection. While many organizations make significant investments in safety management systems, few incorporate safety into their hiring process. Common practice is to screen job candidates for technical skills, experience and education. This is unfor-

fortunate because some new employees will possess safety DNA profiles that put them at greater risk of injury.

Emerging research in this area shows that safety DNA can be measured during the hiring process and that it can help organizations avoid hiring high-risk candidates who are more likely to be injured on the job. A study conducted by Select International examined a group of more than 1,900 temporary employees at two large auto manufacturers who completed a brief assessment that measured safety risk as part of the hiring process. Scores ranged from "poor fit" (highest risk) to "very good fit" (lowest risk) in terms of overall safety risk.

The scores from this assessment were not used as part of the hiring process, allowing the researchers to examine the impact of hiring high risk candidates over time. Twelve months after candidates were hired, results showed that those in the poor fit group were twice as likely (35 percent) as good and very good fit candidates (17 percent) to be injured on the job and file a workers' compensation claim as a result (see Figure 3). Surprisingly, only 9 percent of the candidate sample received a poor fit (highest risk) score, yet their injury rate was 30 percent to 100 percent higher than all other candidates.

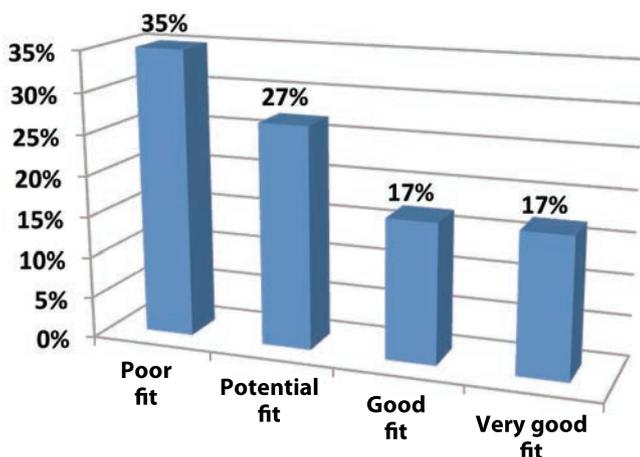
Had this organization screened out these high risk candidates during the hiring process and replaced them with individuals who had a low risk score, it would have lost 850 fewer days due to injury. Savings could have totaled approximately \$270,000 in direct costs and more than \$1 million in indirect costs associated with injuries over those 12 months.

In another analysis conducted with a global manufacturer of electrical equipment, researchers from Select International conducted a longitudinal study to assess the impact that the hiring process could have on safety performance if it pre-screened candidates for safety risk. In order to investigate this, incident rates for existing hires were compared to the incident rates of new hires, with the new employees completing a safety

**Safety DNA can be measured during the hiring process**

## FITTING IN YOUR NEW HIRES

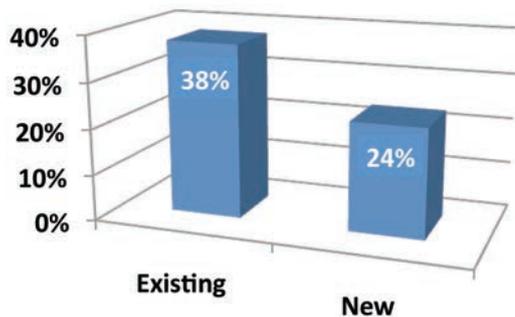
Figure 3. Percentage of workers' compensation claims filed due to injury on the job. New employees with the highest risk scores were much more likely to suffer on-the-job injuries.



# NEWER AND BETTER

Figure 4. Employees hired under a new regimen that assessed safety risks were less likely to suffer work injuries than those who were hired without considering safety DNA.

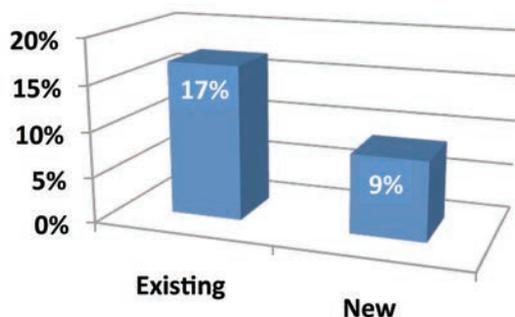
**Percentage incident involvement - existing vs. new hires**



## BETTER HIRING = FEWER OSHA PROBLEMS

Figure 5. Taking safety DNA into account helped one organization hire employees who were much less likely to suffer an OSHA recordable injury.

**Percentage OSHA recordable rate - existing vs. new hires**



assessment as part of the hiring process.

For each group, safety data were collected for a two-year period. The analysis controlled for job experience, and the organization's safety orientation and training programs were essentially the same for both groups of employees. As shown in Figure 4, the results indicated that individuals hired using the safety risk assessment had significantly fewer safety incident rates (24 percent) compared to employees who had been hired through the previous system (38 percent), which did not screen for safety. More importantly, Figure 5 illustrates that the OSHA recordable injury rate for those hired

using the assessment was nearly half (9 percent) the rate of those hired without the assessment (17 percent). This represents nearly a 50 percent reduction in recordable injuries over a two-year period.

This result is comparable to the best performing injury and illness prevention programs in the United States. Based on OSHA data, the best reduction percentage typically achieved is slightly more than 60 percent, while many programs result in less than a 10 percent decrease in injuries. A reduction in injury rates of the magnitude observed in this field study can lead to significant cost savings for an organization, especially since the average total cost of a worker's

compensation claim is about \$40,000 and more than half of all recordable injuries result in lost time, restricted duty or job transfers.

Applying those estimates to this particular case, the organization saved as much as \$2.16 million in direct and indirect costs from injuries prevented by screening out high-risk candidates.

### Putting it all together

As an increasing number of safety professionals and company executives now realize, safety is a journey rather than an actual destination. There is no magic pill or simple solution that will improve safety performance instantaneously. Organizations must use multiple tools, systems and processes to improve safety continuously. Understanding and using safety DNA effectively is a powerful tool that can help close the gap further toward zero injuries.

As evidence for safety DNA continues to grow, organizations have an opportunity to use this powerful new technology as a unique leading indicator of exposure to improve the safety of their current workforce and hire safer employees. The research strongly indicates that individual psychological factors are associated with the likelihood of injury. Further, these factors can be measured in an accurate and reliable way that helps predict future injuries and improve the safety proclivity of new hires.

By truly aligning employee development and selection systems to the organization's safety objectives, significant strides can be made not only in injury rate reduction, but in overall exposure levels and safety performance as well. ❖

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