
HOGAN
PERSONALITY-BASED
MODEL OF SAFETY
PERFORMANCE AND OUTCOMES

INTRODUCTION

In the world of safety, the common school of thought is that training focusing on methods and procedures, combined with the safest equipment and tools, is the ultimate workplace safety solution.

These traditional approaches involve videos that highlight safety policies and procedures, periodic training for equipment operation, updates and enhancements to machinery, daily safety checklists, and other high-level risk management initiatives that often focus on everything but the very people who are expected to benefit. However, over the past few decades, research has indicated that a worker's personality and behavior play a key role – and that taking those factors into account is crucial to creating a culture of safety.

Headlines attest daily to the fact that recurring safety-related issues and incidents are linked directly to decisions that require exercising leadership under stress, with sound judgment and control. It's become increasingly clear that the most effective safety initiatives combine traditional training programs with the assessment of individual personalities.

Hogan Assessments, an international authority in personality assessment and consulting, developed the six scales of safety-related behavior underlying at-risk personalities. The scales were created as a response to requests from companies that wanted to add a safety component to their assessment process. Drawn from facets of the Five Factor Model of personality, these six competencies have been validated as a determining factor based on results across multiple independent samples.

The six scales of safety-related behavior are:

- **Defiant - Compliant:** Low scorers ignore authority and company rules. High scorers willingly follow rules and guidelines.
- **Panicky - Strong:** Low scorers tend to panic under pressure and make mistakes. High scorers are steady under pressure.
- **Irritable - Cheerful:** Low scorers lose their tempers and can make mistakes. High scorers control their tempers.
- **Distractible - Vigilant:** Low scorers are easily distracted and can make mistakes. High scorers stay focused on the task at hand.
- **Reckless - Cautious:** Low scorers tend to take unnecessary risks. High scorers evaluate their options before making risky decisions.
- **Arrogant - Trainable:** Low scorers overestimate their competency and are hard to train. High scorers listen to advice and like to learn.

Research shows that 60 to 80 percent of workplace accidents can be attributed to operator error. When the worker is confronted by unexpected or unusual circumstances outside of normal training, it is the individual personality and behavior that determines whether he or she will zig or zag to avoid an accident.

THE ROLE OF PERSONALITY IN SAFETY

Man-made disasters aren't an everyday occurrence, but they happen often enough – and frequently with extreme consequences costing people their lives. Often, an individual's personality and behavior were factors in whether lives were saved or lost.

Generations of research have shown that various strategies adopted to increase workplace safety do work. Policies and procedures are without question a large part of creating a culture of safety in the workplace. Promoting environmental factors, addressing counterproductive work behaviors, reducing occupational stress and strain, instituting risk management initiatives, and promoting safety values also play important roles.

However, as newer research indicates, this philosophy solves only part of the problem. Injuries and accidents can be further reduced by taking into consideration the psychological makeup of the employee. Consider these six incidents, all of which were widely reported when they happened:

POLICIES AND PROCEDURES ARE WITHOUT QUESTION A LARGE PART OF CREATING A CULTURE OF SAFETY IN THE WORKPLACE. PROMOTING SAFETY VALUES ALSO PLAY IMPORTANT ROLES. HOWEVER, NEWER RESEARCH INDICATES THAT INJURIES AND ACCIDENTS CAN BE FURTHER REDUCED BY TAKING INTO CONSIDERATION THE PSYCHOLOGICAL MAKEUP OF THE EMPLOYEE.

- **The Chernobyl nuclear power disaster** – The world's costliest accident occurred on April 26, 1986. The death toll estimates have ranged from 4,000 to 93,000. However, the total costs, including cleanup, resettlement and compensation to victims, have run into the hundreds of billions of dollars. The accident was officially attributed to power plant operators who violated plant procedures and were ignorant of safety requirements.
- **Continental Airlines Flight 3407 outside of Buffalo, NY** – On Feb. 13, 2009, Flight 3407 crashed just outside of Buffalo, N.Y., killing all 49 people aboard and one person on the ground. Investigations showed that the pilot was insufficiently trained and that the co-pilot was inexperienced and underpaid, and had complained that night of feeling ill. Furthermore, it was revealed that the two pilots were casually discussing their careers just before the plane began having trouble, a violation of federal law that forbids "irrelevant chatter" below 10,000 feet. And finally, the pilot made a tragic decision in the cockpit, panicking under pressure and sending the plane crashing into the ground. The lack of experience and attention to regulations by the pilots played a significant role in the loss of life.

- **US Airways Flight 1549 recovery in the Hudson River** – Flight 1549 crash-landed into New York City's Hudson River on Jan. 15, 2009, after birds struck the plane on takeoff and caused engine failure. However, all 155 people aboard survived when Captain Chesley "Sully" Sullenberger, a former Air Force pilot and an airline safety expert with 40 years of flight experience, and his co-pilot, Jeff Skiles, who has been flying for over 25 years, successfully glided their stricken plane to a relatively safe landing. The experience and training of the two men, combined with their ability to stay calm in an emergency, are credited with saving the lives of everyone aboard. There is little training available for such incidents, but this is a case in point that personality and behavior play a role in safety and accident prevention.

- **Metrolink train crash in California** – On Sept 12, 2008, a Metrolink commuter train and a Union Pacific freight train crashed head-on outside of Los Angeles, killing 25 people in one of the worst train crashes in California history. Investigations revealed that the likely cause was a missed red signal while the conductor was busy text messaging. Lawsuits aimed at Metrolink and its contractors could range from $600 million to $1 billion. Had the conductor not been texting, this accident would likely have been averted.

- **Manhattan crane collapse** – On March 15, 2008, a large construction crane collapsed, killing seven people and putting several others in critical condition as the giant crane crashed into nearby buildings. The city Department of Buildings blamed faulty rigging for the collapse, although some also argued that the crane should have been bolted to the ground, something the building's developers did not want to do. Regardless of who is to blame, adherence to regulations and attention to details ultimately would have spared lives.

- **BP oil spill** – On April 20, 2010, an explosion on the Deepwater Horizon rig off the Louisiana coast killed 11 workers, injured 17 others and, in the months that followed, poured hundreds of millions of gallons of oil into the Gulf of Mexico. BP was previously responsible for an oil leak in Prudhoe Bay, Alaska, and a deadly refinery explosion in Texas City, Texas, and had received over 700 safety violations in its refineries over the past three years. Before the disaster, BP engineers had dismissed warnings from subcontractors that safety-related shortcuts aboard the Deepwater Horizon rig could have disastrous consequences. This unwillingness to listen to advice and learn from mistakes cost BP billions of dollars for cleanup and compensation.

6 LA Daily News, "Suits against Metrolink contractors could net as much as $1 billion", http://www.dailynews.com/news/ci_13303441?source=pkg

7 WABC-TV, "Did piece of nylon cause crane collapse?", http://abclocal.go.com/wabc/story?section=news/local&id=6022288

A SHIFT IN PHILOSOPHY

Occupational safety research is primarily the domain of the human factors field. Although this field contributes many of the ideas and initiatives about workplace safety, its effectiveness is constrained by three factors:

1. The potential for diminished returns once workplace improvements are implemented.
2. Controlling for all possible workplace hazards is nearly impossible for any job.
3. Many efforts focus on work and environmental factors, which have the effect of minimizing the influence of individual worker characteristics.

These limitations highlight the value of expanding successful human factors testing and studies to include consideration of individual personality differences.

Traditional research centers on physical abilities, suggesting that organizations should hire candidates with the physical attributes necessary for them to do the job safely and that candidates should also be trainable to the extent that they can work safely based on their physicality. Another typical approach for safety management in many industries centers on protection with advanced safety equipment.

However, researching psychology and behavior as they relate to safety has increasingly become an area of focus. For example, crew resource management skills is an area of safety research that focuses on training nontechnical skills. The belief is that training for skills such as leadership, communication, teamwork, decision making, situational awareness and stress management can have a significant impact on safety in industrial environments.

ADVANCING THE LINK BETWEEN PERSONALITY AND SAFETY

In the early 1990s, the Five Factor Model (FFM) of personality characteristics introduced a measurement model that increased acceptance of the relationship between personality and safety performance. The FFM provided an organizing framework for classifying personality measurement research, allowing for generalization across different studies, based on these five personality areas:

- **Openness** (inventive/curious vs. cautious/conservative)
- **Conscientiousness** (efficient/organized vs. easygoing/careless)
- **Extraversion** (outgoing/energetic vs. shy/reserved)
- **Agreeableness** (friendly/compassionate vs. competitive/outspoken)
- **Emotional Stability** (sensitive/nervous vs. secure/confident)

Very few studies linking personality to safety have been published in major journals, so linking them had been difficult – the FFM helped make it easier to do so. The FFM was also instrumental in the development of the Hogan Personality Inventory (HPI), the first inventory of normal personality based on the FFM and developed specifically for the business community. The HPI, which has been used to predict job performance for over 30 years, is a high-quality psychometric evaluation of personality characteristics and is used to specifically identify safety-related behaviors.

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A few individual studies published in the last dozen years helps demonstrate the relationship between safety and all five FFM measures. Among the results:

1. The Conscientious factor shows that those employees who are inattentive to detail, unreliable and have difficulty following rules are more likely to have accidents and injuries than those who pay attention, are more reliable and tend to follow rules.
2. Those who score low on Agreeableness have a difficult time getting along with others and prefer to work independently, indicating that they may be well-suited for some jobs but a poor fit for others.
3. Employees who are low on Emotional Stability are unable to handle stress or to cope with uncertain work situations. In a team setting, this can be detrimental in providing a safe environment.
4. Those who score high on the Extraversion factor are overly outgoing and desire being the center of attention. This is another example of individuals who from a personality and safety perspective will be well suited for some jobs, less so for others.
5. Individuals with high Openness seek out and enjoy new experiences and ideas and are more likely to engage in unsafe behaviors because they tend to be more inventive and curious, as opposed to following the rules closely.

CREATING THE SIX SCALES OF SAFETY-RELATED BEHAVIOR

Hogan evaluated previous research and began testing their own models of personality-based individual differences associated with workplace safety behavior and outcomes. Because of the limited data available, the tests themselves were used only on an exploratory basis.

But they helped to provide a more rounded framework on which to base more substantial investigations and testing. Among the major studies Hogan used to expand its research was a study titled "Workplace Safety: a Meta-analysis of the Roles of Person and Situation Factors" (M. Christian, J. Bradley, J. Wallace, and M. Burke).

Hogan summarized the personality characteristics in the above-mentioned study and balanced the gathered information with injury statistics from government sources including the Bureau of Labor Statistics, the Centers for Disease Control, and the National Safety Council.

Using other information and data garnered from studies stretching back more than three decades, and including the FFM, Hogan developed the following model of rationally derived personality scales associated with safety behaviors.

The Hogan Approach

Hogan SafeSystem enables organizations to accurately pinpoint the safety foundation of their workers. Based on hundreds of client research projects conducted over the last 30 years, businesses can predict, and take steps to modify, unsafe behavior. The Hogan SafeSystem is made up of three components to build and maintain a culture of safe working practices:

- **SafeSystem Climate Survey:** Provides critical feedback regarding the existing perceptions of safety at all levels in the organization via a companywide safety score.
- **Hogan Safety Assessment:** Examines individual participant scores against the six safety-related personality competencies and provides valuable information for hiring and developing candidates with safe work behaviors.
- **SafeSystem Coaching Process:** This process is designed to accurately identify and teach safe tendencies within an organizational context, providing leadership with the necessary feedback to build and maintain a culture of safe working practices.

- **DEFIANT – COMPLIANT:** High scorers on this scale tend to adhere to organizational guidelines and are usually rule followers. Those on the defiant end often ignore authority and rules, and can be reckless in doing so, causing accidents and injuries. The nuclear power plant disaster at Chernobyl speaks to this aspect of the scale. Power plant operators defied procedure, ignoring rules and regulations put into place to avoid the kind of incident that occurred.

- **PANICKY – STRONG:** Those who lean toward the panicky end of the scale often buckle under pressure and make mistakes that could prove to be costly, and possibly even fatal. Those at the other end of the spectrum are steady under pressure. The Flight 3407 plane crash outside of Buffalo is a good example of this. The ill-trained pilots panicked, and a series of poor decisions and actions led to tragedy.

- **IRRITABLE – CHEERFUL:** Cheerful employees keep their temperament on an even keel, but those who lose their tempers make mistakes by not staying focused. There's no greater recent example of "grace under pressure" than the actions of the pilots of Flight 1549, the plane that crash-landed into the Hudson River. Staying calm in the face of near-certain disaster, the pilots not only guided the plane to a safe water landing, they were able to keep the plane's passengers calm despite the circumstances.

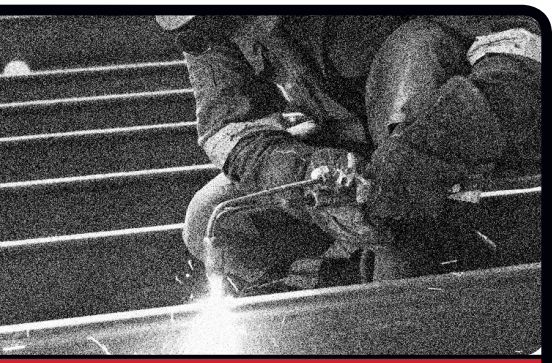
- **DISTRACTIBLE – VIGILANT:** Those who remain focused on the task at hand – usually scoring high on the vigilant side of the scale – tend to be safer than those who are easily distracted. When 25 people were killed in Los Angeles' Metrolink commuter train crash, blame was put on the conductor, who was distracted by text messaging and ran through a red signal light. Had he been vigilant, it's likely this accident would not have happened.

- **RECKLESS – CAUTIOUS:** Those on the reckless end of the scale tend to take unnecessary risks. High scorers evaluate their options before making risky decisions. In the construction crane accident in Manhattan in 2008, it was determined that many costs and corners were cut. This recklessness led to the deaths of seven people and the hospitalization of several others.

- **ARROGANT – TRAINABLE:** Low scorers overestimate their competency and are hard to train. High scorers listen to advice and like to learn. The April 2010 explosion on BP's Deepwater Horizon offshore drilling rig killed 11, injured 17, and poured hundreds of millions of gallons of oil into the Gulf of Mexico. BP was previously responsible for several other oil leaks and another oil refinery explosion, and had received over 700 safety violations in the last three years. Even worse, BP engineers had ignored warnings from subcontractors that there were safety-related shortcuts on the Deepwater rig that could have tragic consequences. Had BP employees been less arrogant about those warnings and previous incidents, this disaster might have been avoided.

CONCLUSION

Over the last century, companies have based their safety methods on a variety of strategies, including buying safer equipment, enhancing procedures, reducing occupational stress and strain, instituting risk management initiatives and promoting safety values.



IMPROVING WORKPLACE SAFETY DOESN'T REQUIRE MORE TRAINING FILMS, PROMOTIONAL MATERIALS OR WORKSHOPS. THE HEART OF THE ANSWER LIES IN EACH INDIVIDUAL WORKER — SPECIFICALLY, UNDERSTANDING THE WAY THAT PERSONALITY CHARACTERISTICS AFFECT SAFETY BEHAVIOR.

Yet it's clear that reliance on traditional methods has left the nation's companies and their workers at risk. The proof is in the $170 billion a year that businesses still spend on workplace injuries and illnesses.

Reducing this staggering figure doesn't require more training films, promotional materials or workshops. The heart of the answer lies in each individual worker — specifically, understanding the way that personality characteristics affect safety behavior.

Thanks to decades of research, we understand more today about the effect that personality and behavior have on safety. A shift in philosophy based on study results places a much greater emphasis on the role of the individual worker. Why, for example, put a distractible personality type at the controls of a train? Even the most extensive traditional safety program can't remove that risk.

It's true that traditional safety training can help employees become safer. But a crucial part of the safety puzzle has been missing. To create the most comprehensive, thorough overall safety climate, a company must combine the right traditional safety methods with safety-based personality assessments.

Hogan Assessment Systems has studied worker personality for decades. In response to requests from companies seeking to add a safety component to their worker assessments, Hogan applied research findings to create Hogan SafeSystem, which enables companies to establish a positive safety climate.

To find out more about the Hogan SafeSystem, visit www.hogansafesystem.com.

Hogan Assessment Systems is a global personality assessment provider that helps companies select employees, develop leaders, and identify talent. Hogan specializes in identifying high potential candidates for targeted positions, providing leadership development tools to help emerging leaders realize their full potential, and determining relationships between individual personality characteristics and safety performance. Hogan's assessments can be administered in over 40 languages and are available on a state-of-the-art platform, giving customers accurate feedback within seconds of completion.