Applying the Psychology of Personality Type to Enhance Workplace Safety

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EXECUTIVE BRIEF

Technologies are designed and operated by people. As organizations become larger, the intersection of technology with people—in increasingly complex environments—leads to the introduction of error into the operation of technologies (Mitroff, 2004). Such errors are introduced at both the individual and organizational levels, and the results of these errors are negative incidents and even crises in the workplace.

Emerging technology plays a decided role in addressing health, safety, and environmental issues in industry, but it has been estimated that 90% or more of workplace accidents are caused by human error (Feyer & Williamson, 1998). Even within the highly regulated oil and gas industry, research suggests that 91–96% of incidents are due to human error (Sentis, 2013).

Given these numbers, we are not surprised that "managers in the [petro]chemical process industry have found human errors to be significant factors in almost every quality problem, production outage, or accident at their facilities" (Chemical Manufacturer's Association, 1990, p.1).

Though some of the specific technological and safety concerns differ across industries (e.g., risks for explosions in coal mining, risks for machine-related injuries in manufacturing, risks of biohazard exposure in pharmaceutical manufacturing), similar human factor concerns (e.g., issues of knowledge, training, self-management, communication, compliance, perceived risk) exist across all industries.

Technological improvements must be combined with the application of psychology via Human Resources to improve safety culture, performance, and worker well-being in organizations. The range of applications of psychology to this task extends from improving the safety culture setting, through enhanced leadership, to building on knowledge of individual differences in communication, risk perception, response to stress, and team behavior.

The risk for significant injury and loss of life are, of course, primary concerns in workplace safety. In addition are the financial impacts of too little attention to safety concerns (e.g., downtime due to destruction of technology, fines, and costs of civil and criminal penalties), as well as indirect costs from safety incidents, such as work delays, damage to the company's reputation, and investigation costs.

Given that a significant majority of hazardous incidents in the workplace are a result of human error, it makes sense to integrate an understanding of human psychology and individual differences into the processes of training and education for workplace safety.

Personality type influences in risk perception, risk response, and decision making

In the context of workplace safety, a conceptual and practical link exists between worker assessment of risk and workplace behaviors that are more or less safe. For example, one of the contributors to workplace accidents is not just error but actual violations by individuals and supervisors, which can be influenced by both individual and organizational factors (Reason, 1990).

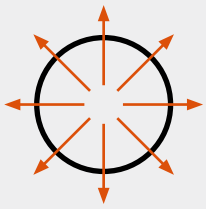
At the individual, supervisory, and team level, perception of and communication about risk influences a person's judgment about which actions are safe to take.

Research has demonstrated links between personality type—as indicated by the *Myers-Briggs Type Indicator*® (MBTI®) assessment—and risk perception, risk seeking, and risk aversion. Personality type mediates one's likelihood to focus on benefits of an action versus the potential hazards of an action—and the perception of the value of engaging in a behavior can be potentially modified by how the risks are framed.

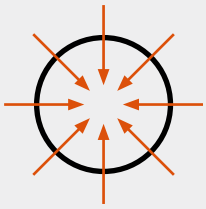
THE MYERS-BRIGGS® FRAMEWORK

The *Myers-Briggs Type Indicator*® (MBTI®) instrument is the world's most popular, and most trusted, personality assessment. Based on Carl Jung's theory of psychological types and backed by decades of scientific research, it has helped millions of people worldwide gain insights into themselves and how they interact with others—and improve how they communicate, learn, and work.

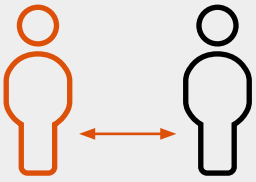
Everyone uses all eight of these preferences but tend to rely on and develop one in each pair more than the other. Each individual's four preferences (one from each pair) combine to form one of 16 possible personality types, signified by a four-letter code (e.g., ESTJ). These preferences are innate, "inborn predispositions" that interact with and are shaped by environmental influences and our own choices.



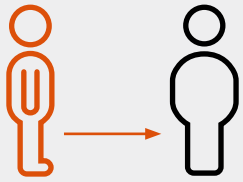
EXTRAVERSION (E)
The natural focus of Extraversion is the external world



INTROVERSION (I)
The natural focus of Introversion is the internal world



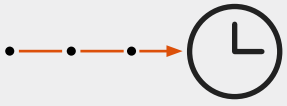
THINKING (T)
Making decisions by stepping back from the situation, taking an objective view



FEELING (F)
Making decisions by stepping into the situation, taking an empathetic view

SENSING (S)
Taking in and perceiving information in a sequential, step-by-step way

INTUITION (N)
Taking in and perceiving information in a snapshot or big-picture way



JUDGING (J)
A planned approach to meeting the deadline in a scheduled way

PERCEIVING (P)
A spontaneous approach to meeting the deadline with a rush of activity

In general, the literature indicates there are stable predispositions in one's personality to be risk averse or risk seeking. Intuition types and often Perceiving types tend to be more consistently risk seeking, whereas Sensing and Judging types tend to be more consistently risk averse (Kowert & Hermann, 1997; Li & Liu, 2008). The relationship between risk response and Extraversion is less clear, though where evident, risk seeking is more related to Extraversion.

Additionally, Harker, Reynierse, & Komisin (1998) found that independent observers agreed in their ratings of behavioral descriptors of individuals whose types were known— but not to the observers. In those ratings, researchers found clear links between MBTI preferences and behaviors that—for our purposes— can be seen to relate to issues of workplace safety and risk management.

The authors, for example, found a relationship between preferences for Introversion, Sensing, and Judging (ISJ) and behaviors such as "likes tested routines," "likes tried methods," and "cautious."

The relationship between personality type and risk assessment, however, is not simply a direct one, with characteristics of the decision environment and objective information interacting with personality type to determine an individual's assessment of risk. Blaylock (1985), for example, found that personality type's influence on a person's assessment of risk varied depending on how structured the decision environment was. The question then became, 'In what situations is risk perception a function of cognitive style?' Findings revealed useful information, such as that changes in the structure of the environment have more impact on a Feeling type's perception of risk than they do for that of a Thinking type.

Also, people with preferences for Sensing–Thinking (STs) or Sensing–Feeling (SFs) have similar opinions about shifts in riskiness caused by changes in hard data, while Intuition–Thinking types (NTs) and Intuition–Feeling types (NFs) are differentially affected by hard data about potential risks. Again, this speaks to the importance of understanding type differences as we educate workers about workplace safety and potentially hazardous behaviors.

Another way in which type interacts with the decision environment suggests that there can be a backlash effect with individuals whose style is typically rule driven. Stetson (2007) showed, for example, that Sensing–Thinking–Judging (STJ) types, in highly structured environments with clear rules, actually increased their likelihood of rule breaking as potential monetary penalties increased. An understanding of personality type gives insight into this kind of counterintuitive behavior and why self-awareness and self-management are critical components of any safety training.

Other literature, too, suggests that Intuition types and Sensing types evaluate risk differently (Rifkind, 1975; Kowert & Hermann, 1997) and are additionally influenced by whether the emphasis in the information is on potential gain or potential loss. Risk tolerance and its impact on decision making has been found to relate to Thinking and Feeling preferences as well, with Thinking types sometimes found to be more risk tolerant and Feeling types more influenced by risk of loss (Filbeck & Hatfield, 2005).

Note how either quality has benefits or downsides depending on the environment and behavior required, and how awareness of an employee's type can offer insight into both strengths and training needs—for example, tolerance of risk can be a strength but becomes dangerous when it minimizes the perception of risk in a hazardous environment.

In all cases, organizational trainers should be aware of the distinctions between individuals who prepare to take risks and those who seek risks (Levenson, 1990), as well as how the training needs of those who are risk averse and those who are risk insensitive, for example, may differ.

Where workplace safety is concerned, there is evidence that personality variables influence how risk is perceived and differences in the relative value of possible benefit in an action versus possible costs.

In short, personality type can affect how an employee might focus on the benefit of a workplace action rather than on the hazards of the action. How potential actions and their

consequences are framed is also known to influence how a risk–benefit scenario is perceived. In addition, we know there is differential effectiveness of hard data for influencing different types in assessing risk. Knowledge of type differences in risk assessment—and how framing and communication can affect motivation—offers a rich ground for enhancing the effectiveness of training for increased safety in the workplace.

Impact of type on leader ship, organizational processes, communication, and team behavior

Error finds its way into the operation of technologies through people's actions—and through problematic organizational processes that allow or even unintentionally support behaviors that enable errors and consequent safety incidents to occur.

The Human Factors Analysis and Classification System (HFACS) developed by Wiegmann and Shappell (2003) outlines individual, supervisory, and organizational contributions to workplace safety and safety incidents. Problematic organizational processes can include a "silo" mindset regarding organizational functions, related communication channels that are sanctioned, time- and money-saving pressures, and reward systems that indirectly support unsafe behaviors and violations or discourage the challenging of operating procedures that may be unsafe.

Such global and systemic considerations are the concern of the leader—both formally and informally—and affect safety culture. Effective leadership means:

- Being aware of long-term financial, employee, and social consequences of decisions.
- Attunement to cross-function considerations.
- Communicating in ways that elicit action.
- Challenging standard processes that hinder rather than help the organization and its people.
- Having the courage to push for culture change and movement forward.

Responding to incidents and crises after the fact isn't enough. Planning for such incidents must precede response (Mitroff, 2004).

Leaders who want to improve both performance and safety in the organization must not only be able to make and implement decisions but also be open to input from internal stakeholders (e.g., those who do the work and observe the hazards directly). Understanding personality type provides key insights into the strengths and developmental opportunities for individual leaders—and particularly in the domain of balancing being open to information and making and implementing effective decisions (Fitzgerald, 1997).

In MBTI terms, this means making the most effective use of one's preferences for Sensing or Intuition and for Thinking or Feeling.

Effective leadership needs to happen at the on-site work team level as well as at the executive level, and there are a variety of resources that can help leaders, coaches, and trainers ensure that leaders are working as effectively as possible (Pearman, 1999; Richmond, 2008).

One component of effective leadership and management is learning to communicate effectively across different types—through understanding differences among team members in terms of preferred mode of communication and differences in motivation.

Personality type literature certainly has numerous suggestions and practices for matching the preferred modes of communication and learning of people with different personality types (Allen & Brock, 2000; Dunning, 2003; Lawrence, 2004). The implementation of such practices, combined with an understanding of differential perceptions of risk, can help ensure maximum information transmission and acquisition regarding environmental and safety issues.

Also on the topic of communication, a sample of industrial safety and health engineers suggests that their preferred operating style is related to their preferences for STJ (Schaubhut & Thompson, 2008). This presents an interesting question for

those whose job it is to transmit/translate the concerns of the engineers to those "on the floor" who are faced with safety issues in their everyday work—that is, those who must learn and act on procedures designed to reduce hazard/risk. Again, we see the importance of learning to communicate across type, both for safety professionals and team leaders.

Johnson (2001), a communication specialist and health physicist, developed some general recommendations for safety specialists in communicating in courtrooms and with other nonscientific parties about the nature of risk. Johnson's recommendations make use of an understanding of Sensing–Intuition and Thinking–Feeling preferences (processes known to affect learning and communication) in crafting one's message for appropriate impact.

Johnson emphasizes, for example, the importance of using the language of practical experience, as well as non-abstract and nontechnical language, to communicate about risk and safety hazards to nonscientific listeners. The author emphasizes that how we communicate influences the perception of risk, which is what motivates people's decision making.

Such recommendations have relevance in the teaching and training of workers about safety procedures.

Developing knowledge of personality type can not only increase the effectiveness of teaching and training but also enhance team effectiveness and reduce the impact of factors contributing to safety incidents.

Particular concerns regarding teamwork, for example, include how team members handle communication and conflict. We are aware that unaddressed conflict leads to a degradation of team performance. If conflict remains unaddressed, the quality of team communication goes down. One team member, for example, may share only the minimum information needed to carry out business with another team member. Such a team environment is not conducive to communicating about safety concerns.

Effective team leadership must allow disagreement on a team, so that concerns about work processes—including issues related to safety—can be heard, analyzed, and integrated to support optimum organizational functioning and employee health and safety.

Research on personality type gives us insight into the impact of type on team processes (Hammer & Huszczo, 1996). Using knowledge of personality type can help build a safety culture in teams through providing clear suggestions for addressing poor team communication, handling conflict, and enhancing team effectiveness (Hirsh, 2003; Killen & Murphy, 2003).

Typological differences in stress response, coping, self-awareness, and self-management

Within the HFACS model, contributing factors to unsafe acts and the preconditions for unsafe acts include the employee's knowledge and skill, as well as cognitive, behavioral, and physical factors such as risk perception, overconfidence, stress, and mental and physical fatigue.

In this domain, the link is clear between psychology and safety considerations—and we can understand the value of training and education.

The opportunities for training lie not only in education about safe operating procedures but also in increasing skills in self-awareness and self-management.

Minimally this should include an understanding of one's cognitive, behavioral, and stress predispositions (e.g., an EJ's stylistic predisposition to get the job done when under stress) that impact safety behavior, and should also include training to increase awareness and management of one's current cognitive and physical state (e.g., an EN learning to attend to signals of physical fatigue, signals which are normally off an EN's conscious radar).

One pathway linking psychology to safety considerations can be found in the differential responses personality types have to hazardous conditions.

Koh (2005), for example, found that psychological factors correlated with MBTI preferences (specifically the Sensing–Intuition and Thinking–Feeling preferences) became relevant to a person's performance while he or she was using a respiratory protective device when there was enough inhalation resistance to cause distress. Awareness of such differences has value in the effective training of individuals to use such devices.

Knowledge of personality type can also provide insight into the perception of, and response to, psychosocial and physical stressors. Armed with this information, training can target the unique needs of individuals' responses that mediate the link between workplace demands and injury.

Allread (2000) conducted research designed to examine how an understanding of how personality type moderates the impact of physical workplace demands and psychosocial stressors helps clarify the causal mechanisms for workplace injuries. Allread's results indicated that personality theory can help us better understand the pathways by which individuals become injured while performing physically demanding work.

Such research also aids ergonomists in designing the workplace to match more comprehensively the capabilities, limitations, and preferences of people with their job.

Poorly addressed stress has psychological and physical consequences and negatively impacts health, quality of life, occupational performance, and job satisfaction. Research on personality, coping, and stress gives us clear insight into phenomena that directly affect safe workplace behaviors.

Although there are similar ways that all human beings respond to stress (Davis, Eshelman, & McKay, 2008), there are also differences among individuals in their stress response. Different personality types are stressed by different things, use different coping skills, show different signs indicating that stress is surpassing their coping skills, and ultimately respond to stress and burnout differently (Quenk, 2003). Davis-Johnson (1991) found personality type–specific coping resource deficits and consequently makes recommendations for type-sensitive and type-specific stress management training and burnout prevention programs.

Here lies an enormous opportunity for training in self-awareness and self-management to address preconditions for unsafe acts—through understanding one's own triggers and cues to stress, as well as ways unique to one's type for managing stress and fatigue—and for improving the foundation for effective decision making.

Summary

Workplace safety is of critical concern in organizations. The direct impact to employee health and well-being is, of course, a primary consideration in building a safety culture. Possible injury and loss of life are the most direct consequences for employees—and for local residents, depending on the scale of a safety incident. There are financial and indirect costs for workplace safety incidents as well, ranging from loss of technology and delays to investigations, fines, and damage to the company's reputation.

Given the significant role of human error in workplace accidents and safety incidents, it is apparent that safety is as much an issue of human performance and psychology as it is an issue of technology. Though specific technological and safety concerns differ across industries, human factor concerns are similar across those industries.

Personality type provides valuable research-based insights into a variety of factors that can support workplace safety and help organizations address processes that lead to errors and safety incidents. An understanding of individual differences through use of the Myers-Briggs Type Indicator instrument can help build a safety culture—and ameliorate contributing factors in safety incidents—by addressing the impact of personality type on the following:

- **Leadership and organizational processes**. Global and systemic contributions to safety culture are the concerns of the leader. Effective leadership development provides the basis for addressing resource management, organizational climate, and processes that either support safety or directly or indirectly support unsafe acts.
- **Team processes**. Effective communication, constructive use of differences and disagreement, and the resolution of conflict are all critical to creating high-performing teams. Team culture and supervisory practices support safety or act as preconditions for accidents, errors, and violations.
- **Individual safety factors**. The role of personality type in intervening with individuals to enhance safe workplace behaviors represents fertile ground for opportunity that requires a multifaceted understanding and approach. Evidence suggests there are typological differences in risk perception and response, perceived stressors and response to stress, awareness of distress and fatigue, and utilization of coping skills. Training in personality type can provide individualized tools for self-awareness and self-management.
- **Training and education**. An understanding of personality and individual differences can enhance educational efficacy in safety training. Type-informed training can address different learning styles and needs in training, help develop an understanding of different motivations, and help bridge gaps between the style and professional mind-set of safety professionals and individuals being educated in safety procedures.

Personality type provides an accessible means for addressing the role of human psychology in workplace safety. The applications of type for enhancing safety and reducing error are wide ranging and extend through training and education to touch on leadership, organizational processes, team behavior, and individual self-management.

The benefits of training in personality type extend beyond its clear links to building a safety culture. Training in personality type inherently affirms the value of individual differences, and in this regard has additional value for the individual, for teams, and for organizational leadership in building not only a physically safe workplace environment but a psychologically healthy one as well.

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