

The Big Five Personality Traits: *Genetic and inherited determinants of behavior*

This is the last of a series of six *ISHN* articles on personality factors related to individual safety performance. Last May, I dichotomized safety performance into two categories: injury proneness and injury preventiveness. Conclusion: Certain personality characteristics increase the risk an individual will perform at-risk behaviors and experience an unintentional injury, whereas other personality dimensions influence one's willingness to engage in injury-preventive behaviors.

A particular personality characteristic could influence injury proneness but not injury preventiveness, and vice versa. However, a certain person factor could affect both of these behavioral categories, even in the opposite directions. For example, one research study showed that people who scored high on a measure of personal control were more likely to take risks, making them more injury prone. However, these individuals were also more likely to follow safety precautions, making them more injury preventive.

The “State” Bias

The April article in this series distinguished between personality states and traits, and revealed my bias toward a “state” perspective. Briefly, this notion is that person factors are dramatically influenced by the environmental context. With this perspective, personality characteristics are not stable but fluctuate according to situational factors. For example, a person might be an optimistic success seeker in recreational activities but be a pessimistic failure avoider at work.

This state perspective is consistent with the focus of psychology at the time I attended graduate school in the late 1960's. Nurture was presumed more important than nature in determining human behavior. Therefore, circumstances and contingencies can be changed to overcome dispositional or personality deficits. This perspective provided significant impetus to psychology as a discipline that can benefit the human condition. If situational factors have more influence on human behavior than biological (or dispositional) factors, then the variety of environmental variables manipulated and studied by psychologists deserves preferential consideration.

This view is consistent with a majority of the self-help books and audiotapes that claim people can improve their attitudes, behaviors, and career success by altering situational factors and following certain self-management steps. In fact, some of these "pop psychologists" proclaim you can "be whatever you want to be" by purposively changing your "state".

What About "Traits"?

Of course, we cannot become any kind of person we'd like to become, even if all relevant situational variables were on our side. We do have physical limitations. And, psychological research conducted over the past two decades has shown that certain personality characteristics are genetically determined and inherited. For example, a systematic comparison of identical twins reared apart after only five months of age with twins raised together showed that those twin pairs raised in the same home were **not** more similar than those raised separately with respect to various personality traits. This and similar research

has led to the conclusion that genetic factors account for approximately 50 percent of individual differences in personality.

Thus, recent psychological research has caused the pendulum to swing toward the nature side of the nature/nurture controversy. Of course, this does not make situational factors insignificant or unimportant. The context in which we perform interacts with personality characteristics to determine behavior. Some situations are more directive than others, and have more impact on behavior than does personality. For example, the 600 students in my introductory psychology class are likely to sit quietly, listen, and take notes, regardless of their personalities. However, at a less restrictive social gathering, the same students' behavior will likely vary greatly as a function of their personality traits.

The Big Five Personality Traits

Many readers are familiar with the "Myers-Briggs" classification of people along four bipolar personality dimensions: extroversion vs. introversion, sensing vs. intuition, thinking vs. feeling, and judging vs. perceiving. This approach is outdated, and not even mentioned in most contemporary psychology texts. Instead, every research-based textbook among more than 20 I consulted that covered personality traits identified the same five primary person factors, among which only the extroversion/introversion dimension overlaps with the Myers-Briggs scale.

Table 1 identifies these personality traits as bipolar dimensions, referred to in the research literature as the "Big Five". Note that the order of the dimensions

presented in Table 1 spell the word “ocean”, making it easy to remember these critical personality characteristics.

<p>Openness to Experience Are you: curious, broad interests, creative, original, imaginative, untraditional, flexible, sensitive, adventuresome</p> <p>Conscientiousness Are you: achievement-oriented, organized, reliable, hard-working, careful, self-disciplined, ambitious, persevering, responsible</p> <p>Extraversion Are you: sociable, assertive, talkative, optimistic, people-oriented, outgoing, fun-loving, affectionate</p> <p>Agreeableness Are you: soft-hearted, trusting, good-natured, helpful, forgiving, caring, cooperative, gentle</p> <p>Neuroticism Are you: worrisome, nervous, emotional, insecure, hypochondriachal, frequent distress, hypersensitive, excitable</p>	<p>...or are you: conventional, down-to-earth, narrow interests, rigid, inflexible, insensitive, crude</p> <p>...or are you: aimless, unreliable, lazy, careless, lax, negligent, weak-willed, hedonistic, impulsive, disorganized</p> <p>...or are you: reserved, sober, cautious, quiet, aloof, task-oriented, shy</p> <p>...or are you: cynical, rude, suspicious, irritable, manipulative, vengeful, uncooperative, ruthless, hostile, self-centered, headstrong</p> <p>...or are you: calm, relaxed, unemotional, hardy, secure, self-satisfied, composed</p>
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Table 1: The Big Five Personality Traits

Substantial research throughout the 1990's indicates these dimensions remain relatively stable over an individual's lifetime, and are generalizable across a variety of cultures. Furthermore, the Big Five personality traits have been found to be 40 to 60% inheritable.

Table 2 provides a few representative questions per each of the Big Five traits. Higher numbers reflect qualities of the particular personality trait, except for

those items followed by an “R”. These need to be reverse scored, meaning the number circled should be subtracted from “6” to make the score consistent with other items.

	Never	Rarely	Sometimes	Often	Always
Openness to Experience					
I have a vivid imagination.	1	2	3	4	5
I have a rich vocabulary.	1	2	3	4	5
I am not interested in abstract ideas. (R)	1	2	3	4	5
Conscientiousness					
I am exacting in my work.	1	2	3	4	5
I neglect my duties. (R)	1	2	3	4	5
I like order.	1	2	3	4	5
I pay attention to details.	1	2	3	4	5
I am always prepared.	1	2	3	4	5
Extraversion					
I feel comfortable around people.	1	2	3	4	5
I start conversations.	1	2	3	4	5
I keep in the background. (R)	1	2	3	4	5
I don't like to draw attention to myself. (R)	1	2	3	4	5
I am quiet around strangers. (R)	1	2	3	4	5
Agreeableness					
I feel little concern for others. (R)	1	2	3	4	5
I make other people feel at ease.	1	2	3	4	5
I feel others' emotions.	1	2	3	4	5
I insult people. (R)	1	2	3	4	5
I take time out for others.	1	2	3	4	5
Neuroticism					
I change my mood a lot.	1	2	3	4	5
I get upset easily.	1	2	3	4	5
I worry about things.	1	2	3	4	5
I get stressed-out easily.	1	2	3	4	5
I am relaxed most of the time. (R)	1	2	3	4	5

Please do not consider your totals on these select items to be a valid measure of the Big Five. Rather, read the items to improve your understanding of each personality trait, and use individual scores to activate conversations about these constructs and their relation to safety-related behaviors. How do the Big Five affect safety performance?

Relevance to Industrial Safety

To date, research has not studied specific connections between the Big Five and injury proneness or injury preventiveness. However, certain relations between these personality traits and safety-related behaviors seem reasonable and worthy of serious consideration and systematic study. For example, my April contribution to this series made a case for a positive correlation between anxiety and proactive injury prevention, and the definition of anxiety I used in that article is similar to the neuroticism dimension. In addition, it's likely individuals scoring high on conscientiousness are more apt to participate in an injury-prevention process.

I predict those scoring relatively high on openness to experience will be more likely to accept and participate in an innovative approach to injury prevention. And, common sense suggests that injury-prevention procedures requiring interpersonal conversation (such as a behavioral observation and feedback process) will be more acceptable to those who score high on extroversion and agreeableness. Plus, it's likely those with these personality traits will be more successful at implementing an interpersonal coaching process.

These hypotheses reflect only a few of the possible ways the Big Five could influence industrial safety. Clearly, systematic research is needed in this domain, especially given the pervasive behavioral influence of these five genetically-determined dimensions of human personality. There is much to be learned about the personality/behavior connection, especially with regard to industrial health and safety. I hope this article, and the five others in this series activate relevant conversations and perhaps some breakthrough understandings and research questions regarding the role of personality traits and states in achieving an injury-free workplace.

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Dr. Geller and his partners at Safety Performance Solutions (SPS) help people develop, refine, and implement interventions that prevent workplace injuries. SPS is offering a series of seminars throughout 2004. For more information about these seminars, related books, training programs, video and audiotapes, and customized consulting and training options, please visit safety@safetyperformance.com or call us at 540-951-7233.

Note: If you are interested in participating in our ongoing research to study personality determinants of occupational safety, please contact Douglas M. Wiegand at dwiegand@vt.edu or (540) 231-8145. Or, log on to www.safetyperformance.com and view the link to the Safety Identity Questionnaire (SIQ).