

It's Not Common Sense: Safety management requires a research perspective

Last month my *ISHN* article addressed the concept of “root cause.” I attempted to convince you that this term is misused in occupational safety. Safety professionals look for the root cause of an incident when there is not one to be found, and they do this with techniques that couldn't determine the single cause of an incident if there was one. Most importantly, the actual process of searching for a root cause through interpersonal interviews and surveys can inhibit the very kind of frank and open conversation needed to identify the various environmental and behavioral factors that need to be identified and addressed in order to achieve a safer workplace.

I used basic research principles to show that a cause-and-effect relationship cannot be found without manipulating at least one specific independent variable and observing the impact on a certain dependent variable. Such research activity is not beyond the expertise and scope of a safety pro, but it is seldom performed. Why not? Why is there so little safety-management research accomplished by safety professionals? Why do so many safety-management presentations come across as someone's subjective opinion instead of the results of empirical and objective observation?

A Straightforward Research Process

Part of the problem is obviously the lack of experience or perceived skills in safety-management research. But, the methods needed to conduct and interpret basic field research are straightforward and convenient. Line workers in companies worldwide are conducting safety-management research as part of

their behavior-based safety process. My associates at Safety Performance Solutions call this the DO IT research process.

First, specific behaviors to increase or decrease in frequency are operationally **defined (D)**. Then these behaviors are objectively and systematically **observed (O)**. After obtaining a baseline level of occurrence for these behaviors, a particular **intervention (I)** strategy is implemented. These behaviors are continuously observed and recorded during the intervention period, and thus the impact or effect of the intervention technique is **tested (T)**.

Need for a Paradigm Shift

I'm afraid the lack of intervention research is due more to perspective than a lack of knowledge and talent. There seems to be an overriding notion among safety pros that management for injury prevention requires only good common sense. As a result, we have safety incentive programs, root-cause analyses, discipline procedures, and corrective action plans that do not make a workplace safer. In fact, many of these programs do more harm than good.

How do I know various "common-sense" approaches to injury prevention are ineffective? Answer: research. Through objective observation and systematic application of the DO IT process, researchers have demonstrated what works and what doesn't work to get people involved in safety-related activities that can lead to a safer workplace. Many of these research-based strategies are illustrated in books written especially for the safety professional. An example is my recent text, *The Participation Factor: How to Increase*

Involvement in Occupational Safety, published this year by the American Society of Safety Engineers.

However, given the seemingly predominant mindset that safety management requires only the application of basic common sense, research-based books will be under-used. Why should we take the time to read books and articles on the human dynamics of safety, when most of this is only common sense?

My students learn quickly that psychology is not common sense when they perform worse than desired on an exam. However, safety pros may never learn the fallacy of their common sense unless they conduct a thorough and objective evaluation of their safety-management procedures. And, this won't happen without a paradigm shift – a change in the common sense illustrated by the following review of a article published last fall in *Professional Safety (PS)*.

A Non-Scientific Approach to Safety

A “research” project detailed in *PS* attempted to predict the future of the safety profession by collecting the opinions of 120 ASSE chapter presidents. Of this group, 54 gave their opinions on a survey that asked the participants to identify “up to 10 trends you feel the safety profession will experience between now and Dec. 31, 2009.”

An initial list of 168 different predictions, obtained from this survey, was returned to the participants with a request that they identify their top 25 predictions. A total of 35 safety pros from the first group completed this round which resulted in a list of 46 predictions.

Then, those who participated in Round Two were asked to rate each of the 46 predictions on a one-to-four scale. Statistical tests were performed on the ratings received from 33 remaining participants to determine whether the opinions changed significantly between the last two rounds. The process ended, and the list of 46 predictions was published in *PS* as a “valuable planning tool for safety professionals.”

I hope your common sense tells you this list of 46 opinions should be given minimal credibility and should not be used to plan anything important. The publication in *PS* might appear to be research, complete with statistical tests, but it is not. It violates a basic principle of the scientific method – empiricism. Real researchers rely on direct experience that is objectively recorded and evaluated, not hearsay or other people’s opinions.

Let’s consider four more qualities of scientific research which require our understanding and appreciation before a research approach to safety management will ever be able to substitute for the prominent common-sense paradigm.

Research is Objective

The reporting of observations from experience must be objective, meaning other people would have made the same observations if they had been there. For this to happen, the procedures involved in the experience must be documented so other individuals can observe the same variables and arrive at the same results. Thus, scientific research involves careful and unbiased documentation of exactly what happened and precisely what was observed.

Objectivity means the observations recorded by one person would be available to any other person if they repeat the same conditions, including the observation process.

Research is Self-Correcting

The DO IT process reviewed above is a continuous improvement process. Interventions are progressively made more effective and new behaviors are continuously and successively defined and observed for beneficial treatment. This process of never-ending improvement epitomizes science. Empirical evidence is constantly being discovered that contradicts prior knowledge and opinion.

Thus, scientists are open to change, and most importantly they modify their opinions and knowledge as a result of reliable research results. In this case, “common sense” is replaced or confirmed by knowledge that is founded on applications of the scientific method, and future changes in profound knowledge only occur as a function of objective observation.

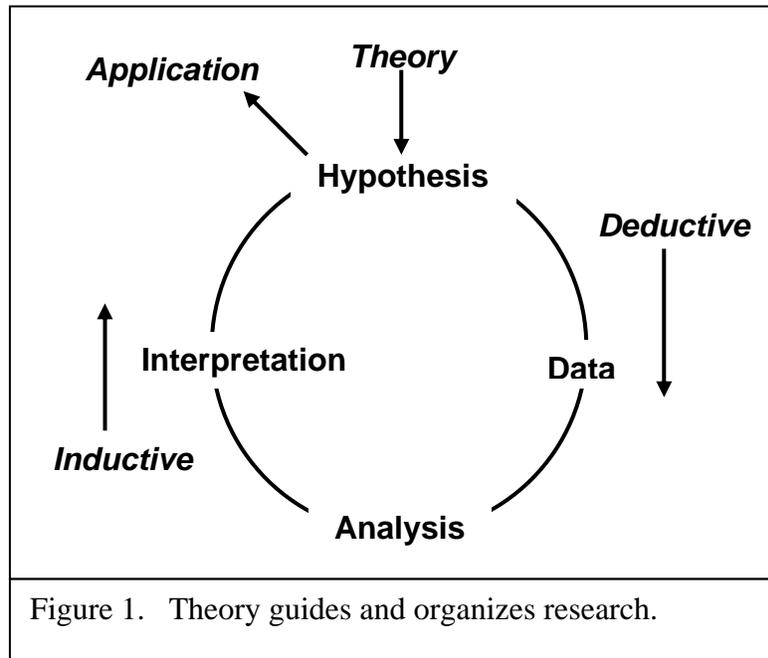
Research is Progressive

Unlike human activity in the arts and humanities, science is progressive. In other words, at any one time the knowledge obtained from research is tentative and is continuously tested to advance its accuracy or its ability to improve quality of life. In contrast, while paintings, music, literature, and fashion in clothes certainly change and influence behaviors, attitudes, and culture, such change is usually not considered progress. Quality of life does not advance through periodic changes in popular clothes, music, or art.

Research Develops and Tests Theory

Theory has two basic functions: 1) to guide the design and interpretation of research, and 2) to integrate and organize facts from research into parsimonious concepts or principles.

The role of theory in guiding and integrating research is depicted in Figure 1. As shown, research is designed to test hypotheses derived from theory. The development of an observation and data-



collection process to evaluate a theory is deductive, meaning the research design defines a specific set of circumstances inferred from a certain theory or hypothesis. The results support the theory, reject the theory, or suggest how to refine the theory.

The process of interpreting research data as supporting or not supporting a theory-derived hypothesis is inductive, because now we are deriving general principles from a particular research observation. The reasoning is from the more specific to the more general. The inductive interpretation of research

observations often leads to theory change and the derivation of another hypothesis to test.

Sometimes, after successive theory testing, data interpretation, and theory refinement, application is called for. In other words, the research enables objective refinement of a theory or set of principles which can be applied in real-world circumstances to benefit people and/or the environment in which they exist. For occupational safety and health, this means research uncovered an environmental manipulation, process, or intervention that can truly reduce the probability of unintentional injury.

In Conclusion

One of my favorite quotes from W. Edwards Deming is “There’s no substitute for knowledge.” In my “opinion,” profound knowledge for safety management should come exclusively from scientific research, not from intuition or common sense. Common sense might be the basis for an original theory, but it must be modified according to the results of real scientific inquiry. Common sense can then benefit from research, inasmuch as the theory continuously improves from the deductive-inductive process of designing objective evaluation procedures, or empirical tests that provide objective data relevant for supporting, rejecting, or refining a particular presumption or thesis. People with a research perspective continuously change their common sense according to empirical, objective, and progressive information.

Research has shown some current common sense or theory applied to safety management is seriously flawed. But, research can be used to improve

these approaches to safety management. This requires a paradigm shift for many safety pros. This needed change in perspective is contingent on embracing the five qualities of scientific research reviewed here.

E. Scott Geller, Ph.D.
Professor and Director
Center for Applied Behavior Systems
Virginia Tech

Dr. Geller and his partners at Safety Performance Solutions help organizations use research-based methods and tools to improve the safety of their workplace. For more information about 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.