Risk Homeostasis and the Science of Sensation Seeking

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Skydivers love the Theory of Risk Homeostasis. It is easy to understand, intuitively attractive and explains why we like to jump out of airplanes.

Risk homeostasis is the brainchild of Dr. Gerald Wilde at the Queens University in Kingston, Ontario Canada. Wilde was studying traffic safety when he noticed that data on traffic accidents revealed unexpected results. For example, accident mortality rates stayed the same for the first 75 years of the 20th century, in spite of constant additions to auto safety devices, laws intended to increase safety and improvements in road technology. Interestingly, average speeds increased at about the same rate as safety improvements.

As Wilde thought about it and examined more statistics, he constructed the Theory of Risk Homeostasis. The basic idea is that each of us has a level of risk with which are comfortable and we change our behavior to maintain this level of risk. For example, when we are driving we slow down when the pavement gets wet and speed up when it is dry. Wet pavement increases the risk of getting onto an accident, so we slow down to maintain the same level of risk that was present when we were driving on dry pavement.

To complicate matters our accepted level of risk changes with circumstances. If we are late for work, for example, we will tolerate more risk and drive faster than we might otherwise. This is why risk homeostasis is sometimes called offsetting behavior or risk compensation.

Dr. Wilde has collected evidence to support risk homeostasis in his book Target Risk. A German taxi company added a number of cars with anti lock brakes to its' fleet and experienced an *increase* in rear end collisions caused by its drivers. ABS systems decrease the distance it takes a car to stop, so this was an unexpected result. It seems that drivers learned they could follow cars more closely when driving a cab with ABS systems yet avoid rear end collisions. (A fascinating aspect of this case is that drivers did not realize they had learned anything or had changed their driving habits.) When drivers switched to cars that were not equipped with ABS systems collisions occurred. The decrease in risk provided by the ABS system resulted in drivers changing their behavior and following more closely in order to maintain a constant level of risk.

In a study of accident data collected when driver side airbags were hitting the market showed that accident rates and fatalities increased for cars equipped with airbags. It seems that early adopters of air bag equipped vehicles bought such vehicles because they tended to dive more aggressively, and increased that behavior when driving airbag-equipped cars.

One of the problems with the theory of risk homeostasis is that it is very hard to apply measurement. Science is all about defining things and measuring their effects; looking at things from the perspective of risk homeostasis theory makes measurement and definition incredibly complex. However, there may be a solution.

Dr. Marvin Zuckerman of the University of Delaware has been studying something very similar to risk homeostasis for forty years. Rather than thinking if it as a balancing act between a need for excitement and the environment Dr. Zuckerman looked at risk behaviors as a personality trait. Because he approached it form this angle he was able to build on well established personality theory and measurement tools.

Dr. Zuckerman calls it sensation seeking. He became curious about sensation seeking during the early 1960's while he was studying sensory deprivation – the psychological effects that ensue

when people do not experience sensory input – no lights, no sounds, no sense of touch, taste or smell. The brain is an organ that lives to process information. Take that information away and a wide variety of reactions can occur occur – everything from boredom, anxiety and a dulling of intelligence to full blown visual, and auditory hallucinations. Curious about why some people experienced extreme reactions and others did not Zuckerman began developing questionnaires modeled after personality tests.

He quickly found that a significant portion of the population engaged in a range of behaviors primarily aimed at generating novel sensations. The subjects of his sensory deprivation experiments seemed to come in two groups – those who needed the money in exchange for participating and those who wanted the unusual experience. Dr. Zuckerman noted that the later group tended to include people with long hair, carrying motorcycle helmets, and dressed in unusual styles. This observation led him to refine his questionnaires and address activities outside the laboratory.

Over the years Dr. Zuckerman found out enough about sensation seeking to write a couple of scholarly books about the topic and produce over a hundred academic research papers. He studied gamblers, entrepreneurs, delinquents and differences in men and women, as well as risk sports enthusiasts like skydivers, BASE jumpers and rock climbers.

He made a significant discovery in 2000 when he published proof that behavioral risk taking is associated with a particular gene that codes neurons for interaction with brain chemicals. The D4DR gene is a short version of the gene that influences the way brain cells process dopamine and serotonin – the "gas pedal and brake" of brain activity. It seems that risk takers need more stimulation to get the same level of excitement that others do. This explains why skydivers report that making a jump can be both stimulating and relaxing. Stimulating because the visceral excitement was enough to activate the "thrill center" of the brain, and relaxing because of the sense of calm that comes afterwards.

But not all risk takers are equal in terms of the stimulation they pursue. There are four distinct subgroups, although a good deal of overlap occurs.

Thrill and Adventure Seeking

This refers to physically risky behaviors that we are all familiar with. Skydiving, motorcycling, BASE jumping, SCUBA diving supply the sensations we crave.

Experience Seeking

Some sensation seekers revel in novel experiences within the mind. Intellectual pursuits, art, music and culture are the playgrounds for these folks. They may travel to experience different cultures, or create new cultures at home, such as the punk movement or Goth culture.

Dsinhibition

Disinhibition means a lack of inhibition. These people tend to be gregarious, outgoing and socially oriented. They are the partygoers, spouse swappers, recreational drinkers, and drug users who love to have a good time with their friends.

Boredom Susceptibility

As the name implies these are people who have a low tolerance for predictability and constantly look for new sensations. There has been speculation that Attention Deficit Disorder and Boredom Susceptibility might be related. Very little is known about the exact mechanism of the brain chemistry involved in these traits, but they are probably closely related.

Skydivers probably identify with most of these traits, but Thrill and Adventure seeking is likely the best "fit". Just the same, skydivers are famous for their parties, love of new music and styles, and low tolerance for predictability. Simply jumping from an airplane satisfies the need for Thrill and Adventure Seeking; it is the other aspects that produce Freestyle, Swoop competitions and videos of skydivers doing relative work with rafts, cars and bicycles.

These subgroups address the question of why people are attracted to different kinds of sensation seeking. Skydiving and skiing are both very fast activities, but rock climbing is much slower and more deliberate. Why do people tend to prefer one over the other? This also opens the door to including other activities as sensation seeking. Serial entrepreneurs for example work hard and take great risks to launch a business, but then become bored when the business is secure and look to start another business.

So where does this leave risk homeostasis? Academic researchers favor the approach of Zuckerman and sensation seeking because it lends itself to measurement and analysis so much better than risk homeostasis. But risk homeostasis has value because it is easily understandable, and captures the spirit of sensation seeking. Academic research pushes culture and technology ahead, but unless it can be communicated so that normal people can understand its significant it loses much of its value. Most academic researchers want their work to improve the world in some way. It is very unfulfilling when only other researchers can understand or benefit from what one studies. Risk homeostasis solves that problem by presenting behavioral risk in a way that everyone can understand.

This is an exciting time for people interested in sensation seeking. It is a very young field and not much is known about it. It has application to vexing social problems like juvenile delinquency, sexual risk taking, drug abuse, and domestic violence. Just maybe, people who would otherwise ruin their lives engaging in destructive behaviors, (and create huge social costs), could satisfy their need for excitement more appropriately by taking up sports like skydiving.

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