Behavior

Healthy talk among Holocaust survivors

There are two schools of thought among mental health workers concerning the treatment of people who have experienced a massive psychological trauma. Many contend that emotionally confronting the trauma will quell its devastating aftereffects. Others say the key to successful adjustment lies in learning to forget, rather than reexperience, traumatic events.

A recent study of survivors of World War II's Holocaust who now live in Israel lends support to the latter argument (SN: 7/1/89, p.4). But a report in the September-October PSYCHOSOMATIC MEDICINE suggests that talking candidly about past traumas may indeed boost the mood and physical health of Holocaust survivors.

Psychologist James W. Pennebaker of Southern Methodist University in Dallas and his colleagues recruited 33 Holocaust survivors who talked for one to two hours about their personal experiences during World War II. As the survivors spoke, researchers monitored electrical conductance levels in their skin. Previous studies of college students describing traumatic experiences in their lives indicate that lowered skin conductance reflects a person's ability to confront and openly discuss such events, Pennebaker says.

The Dallas researchers videotaped each interview, and independent judges rated the degree of trauma expressed during every minute of the session.

Participants had endured a variety of Holocaust horrors, such as concentration camp imprisonment or witnessing the execution of family members.

Nine survivors showed a drop in skin conductance as they disclosed traumatic experiences. When contacted 14 months later, they reported a significant reduction in physical problems and physician visits since the interview, as well as a more positive mood. These "high disclosers" readily showed emotion when describing their ordeals and said they had talked about the Holocaust with others prior to the interview.

In contrast, nine "low disclosers" displayed marked jumps in skin conductance while talking about traumatic events and reported the most physician visits for health problems during the follow-up period. They tended to keep their emotions in check while recounting Holocaust traumas and had largely refrained from discussing their past with others.

The remaining 15 subjects showed no link between skin conductance and trauma disclosure. Their subsequent measures of physical health and mood slightly improved, falling between those of the high and low disclosers.

Although dredging up the Holocaust memories of "low disclosers" may have contributed to later health problems, Pennebaker notes, the same subjects reported finding the interview the most psychologically helpful. "This was the first time they had confronted their past," he says. "After the interview they were able to talk more openly about their traumas with family and friends."

In the previously conducted Israeli study, well-adjusted Holocaust survivors often could not remember dreaming and recalled few Holocaust-related memories while awake. Researchers who conducted that study say massive unconscious repression of the entire Holocaust experience apparently served these individuals well.

Pennebaker disagrees. "I'd predict the well-adjusted Israeli survivors talked about their Holocaust experiences with others many years ago and largely resolved the trauma," he says. "Thus, it's easier for them not to think about the Holocaust now. They're probably high disclosers."

A major gap exists in all studies of trauma survivors, Pennebaker adds. Researchers do not know whether, prior to their tribulations, survivors had personality characteristics well- or ill-suited to dealing with stress and trauma.

Earth Sciences

Heady theory for largest eruptions

The explosive eruption of Mount St. Helens in 1980 carpeted portions of eastern Washington and nearby states with a layer of loose ash several centimeters thick. Consider an eruption that could cover all of Washington and Oregon with a 5-meter-thick layer of solid lava. Roughly that amount of molten basalt poured out of cracks in India 66 million years ago, during a geologically brief period lasting less than half a million years. So-called flood basalt eruptions such as these represent the world's largest volcanic releases, but scientists have yet to agree on an explanation for the massive molten outpourings. One theory holds that plate tectonic forces near the Earth's surface generate flood basalts. But a group of geologists now implicates far deeper portions of the Earth.

According to the surface theory, when tectonic forces stretch and rip apart a continent, the mantle directly underneath can rise into an area of lower pressure. Such decompression causes portions of the solid mantle to melt and rise to the surface through fissures, where the molten rock pours out as flood basalts.

In the Oct. 6 SCIENCE, Mark A. Richards of the University of Oregon in Eugene, Robert A. Duncan of Oregon State University in Corvallis and Vincent E. Courtillot of the Institute of World Physics in Paris, France, offer support for an opposite model. In their scenario, hot rock rises from the deep mantle to trigger the massive eruptions. As it rises, it forms a plume with a "head" and a "tail" region, looking a bit like a balloon on a string. When the large head reaches the crust, it heats the surrounding solid rock, generating lightweight molten material that rises to the surface through cracks. The head region causes a period of massive volcanic outbursts, which then die out.

This model would also explain the linear tracks of volcanoes, such as the Hawaiian island chain, that appear across the globe. These chains form as a continental or oceanic plate passes over an abnormally warm region of the mantle called a hot spot. As the plate moves, the stationary hot spot spawns a line of volcanoes. Richards and his colleagues propose that the tail of the plume would feed the hot spot.

Others have suggested portions of the head-and-tail theory, but this model is the first to pull the entire scenario together, says Duncan. He notes that some flood basalts might be related to continental rifting, but he says the eruptions *cause* rifting—an idea in direct opposition to the theory that rifting causes flood basalts. To help determine whether either of these two models is correct, geologists will have to perform detailed studies of flood basalt formations to learn whether the eruptions came before or after any associated rifting.

Swarm of micro-earthquakes in Maine

Although the West Coast is the United States' best-known earthquake country, the midcontinent and East Coast have also experienced disastrous shocks. Few people recognize the earthquake hazards in these regions because the large tremors occur infrequently. Nonetheless, smaller quakes do occur frequently outside the West Coast. At a meeting of the Seismological Society of America last week in Lexington, Ky., scientists described a zone in central Maine near Dover-Foxcroft that is generating many small quakes.

Since June, when they set up a network of seismometers in the area, John E. Ebel from Boston College and William E. Doll from Colby College in Waterville, Maine, say they have detected 30 tremors, ranging up to a magnitude of 1.2 on the Richter scale. Although the small shocks cause no damage, the researchers say seismic measurements of these tremors will help them determine whether this area faces the threat of larger quakes.