

The Psychology of Pain

Physical pain is something everyone experiences. We bump our elbows and the pain shoots up our arms. We touch a hot stove and it burns. We wrench our backs and the pain shoots upward. We take a big bite of ice cream on a warm day and our heads throb. Most of us also realize that each of these experiences involves signals traveling along nerves from the source of the pain (elbow, finger, back, scalp) to our brains. In each case the pain is usually acute; that is, it subsides fairly quickly. Chronic pain is more complicated in that it continues long after the initial insult to the body. Chronic pain also accounts for most of our use of analgesics (so called “pain-killers”), which are chemicals that act on the brain to dampen the pain signals coming from all those other places in our bodies. Unfortunately, the effectiveness of analgesics diminishes over time, and the strongest ones such as narcotics are addictive, which makes for an ineffective way to manage pain.

Recently a series of articles in the journal *Science* (Issue 6312; Nov. 4, 2016) report new developments in pain research that help us understand the complexities of pain. Pain signals have both a sensory component (the physical sensation) and a cognitive-affective (thinking and feeling) component. The sensory component is a bottom-up pathway that sends signals to the brain, and the cognitive-affective component is a top-down pathway that transforms these signals as they reach the brain. Interestingly, neuroimaging studies show that we don’t actually experience pain until the bottom up signals are processed high up in the conscious part of our brains. The experience of pain takes quite a bit of processing, and the top-down system can either diminish or amplify the perception of pain.

Thus, pain is not simply an alarm going off at the flick of a switch but is “an actively constructed experience” (Wiech, 2016). Bottom-up signals are processed against a “template of expectation that reflects prior information” (p.586). This means that what we expect strongly influences what we experience. Consider for example the football player who gets hit hard during a play and feels it as he goes to the bench. He expects it to hurt and it does, but his mind is likely also on the game, which shifts his attention away from the pain. Now consider the same player who is out with an injury and sitting on the bench watching his team play. His pain has now become a source of irritation, and it comes with a gnawing fear that it might not get better. His pain experience is loaded with emotion and quite different from the earlier experience.

Consider the term “chronic pain” label. How many people diagnosed with chronic pain expect to obtain relief? The label itself sets patients up for negative treatment expectations, and each treatment failure only reinforces negative expectations about pain relief. On the other hand, people who have high positive expectations for particular treatments often experience relief from these treatments, even if they are placebos (that is, have no active ingredients).

So how do we change expectations? Expectations are usually changed by new information. Just realizing that what we physically feel at any moment is influenced by what we’re thinking and

feeling in general is a basis for improving expectations. Paying attention to mood (feeling angry, sad, tense, anxious, elated, excited, calm) and to sensory information (temperature, noise, lighting, internal states such as digestion) provides us information that may affect our sensation of pain. Identifying situations that seem to intensify pain (driving, being around certain people, paying bills) or that coincide with pain relief (listening to music, being around certain people, meditation) is another form of such information. Taking advice from people we trust may be another way to change expectations, which speaks to our relationships with our physicians, physical therapists, and other health care providers. Finally, challenging our beliefs about pain, such as the idea that life with pain is not worth living, or that pain always means suffering, may prepare us for painful times ahead.

Wiech, K. Deconstructing the sensation of pain: The influence of cognitive processes on pain perception. 2016. *Science* Vol. 354, Pp 584-587.