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The Anatomy of Anger

The seat of all human passion is the amygdala (from the Greek word "almond"), an almond-shaped cluster of structures that sits on top of the brain stem. This is the most primitive part of the brain, the part we share with birds and reptiles, hence, the "bird brain." The amygdala is the brain's specialist for emotional matters. Sever the amygdala from the rest of the brain and there is no anger, fear, sorrow, or tears. Without the amygdala, life's events become stripped from their personal meanings.

What happens in the brain when impulsive feelings of anger override our ability to handle things rationally? When incoming signals from our senses come into our brain, they are processed by the thalamus, the "receptionist" of the brain. The thalamus translates the signal into the language of the brain. Most of the message is then sent to the cerebral cortex, where it is analyzed and assessed for meaning and action, hence, the "thinking cap." If that response is emotional, if there is, for example, a signal of danger, the signal is sent to the amygdala. A smaller part of the original signal goes straight from the thalamus to the amygdala, allowing for a faster, although less precise, reaction. This is why we can sometimes feel angry or upset even before we realize what is bothering us. Thus, the amygdala scans every experience for trouble. It asks the most primitive question of every situation: "Is this something that I hate, that hurts me or that I fear?" If the answer is "Yes," the amygdala sends a signal to every part of the brain, telegraphing that there is a "crisis." This whole process takes less than a second.

When the amygdala senses danger (the primary emotions of fear or pain), either real physical danger or psychological danger (a threat to our self-esteem), it triggers the secretion of the body's fight-or-flight hormones that mobilize our centers for movement, activate the cardio-vascular system, the muscles and the gut. We get angry. The face is fixed in an angry or fearful position, the heart rate and blood pressure go up and hormones from the kidneys stimulate the production of cholesterol in the liver. Importantly, the amygdala's web of connections allows it to capture the other functions of the brain, including our ability to think rationally.

"If only I would have thought to say that then." How often are we able to think of "just the right thing to say" only after we've cooled down, hours and sometimes even days after we've been angry. This occurs because the amygdala's web of connections allows it to capture the other functions of the brain, including our ability to think rationally. This experience is called an "emotional hijacking," the brain is literally incapable of thinking rationally when we're angry because the amygdala, "fight or flight," denies us access to the parts of the brain that analyze and solve problems. This is why taking a "time out" is often the best way to "come back to our senses" when we're angry.

Why is our anger sometimes way out of proportion to the experience that stimulated it? When the amygdala senses danger, it stimulates the production of two hormones. One acts immediately to get the body ready to fight or flight. The other acts much more slowly, keeping the body in a state of readiness for hours and sometimes even days after the initial stimulus is forgotten. When the constant stresses of life cause this second "slower" hormone to build up in

our body, a stimulus of lesser significance can cause an intense reaction (only a few drops can cause an already full cup to overflow). If we're already stressed out, or if we've had an especially rough day and the anger-causing chemicals have already been produced (the cup is almost full), an emotional hijacking can take place, with all its gross physical reactions and irrationality, even if the stimulus is small (dinner's not ready on time, someone in front of you fails to signal their turn, etc).

Does venting help? There are two kinds of venting. *Destructive* venting involves screaming, cursing, punching and raving (the actions associated with rage). Studies of the brain have shown that this kind of venting actually stimulates the production of the hormones that keep us angry and does nothing to decrease our level of anger. *Constructive* venting, on the other hand, involves talking about our pain and fear in an honest and straightforward way. Pain and fear are the two primary emotions that underlie the expression of anger (a secondary emotion). Angry, irritable people are hurting people. When we have the opportunity to express our emotions in a constructive, honest way, the production of the hormones that lead to anger is reduced in the amygdala.

Two experiences can help reduce anger:

1. Reduce stress before we experience the stimulus that makes us angry (decrease the amount of liquid that in the cup, so that when the danger comes, the cup does not overflow). A. good diet, sleep, exercise, a balanced social life, therapy (constructive venting) and a quality spiritual life helps here.

2. Experience with the stimuli that cause us stress (training). Other people in our community have experienced similar circumstances and have learned how to handle them effectively. Learn from them. Practice handling the situations you experience as dangerous. Familiarity and expertise gained in handling difficult situations often reduces stress. Think of astronauts, football players, musicians, anyone who practices.