Processing Speed

Not only are researchers fascinated with the idea that humans possess an "internal clock" … the fact that it controls and regulates so many of our human abilities like our thinking (or processing) speed … but they are also very interested in seeing if they can manipulate the brain's clock by speeding it up or slowing it down. Previous research has shown that repetitive stimulation has an effect on a person's internal timing by either speeding it up or slowing it down, depending upon the goal and type of stimulation provided. This was again demonstrated in a study by Droit-Volet & Wearden (2002) where they provided repetitive stimulation to children of a variety of different ages to "speed up" their internal clock or ability to process information faster. In my experience with Interactive Metronome (IM), I have found that the repetitive auditory/visual stimulation of IM training has a very definite impact on processing speed. This has been repeatedly evident on standardized post-testing. Taub et al (2007) studied the effect of IM training on reading skills in elementary school children and proposed that the improvement seen in reading may be attributed to IM's effect on "clock speed." The repetitive stimulation of Interactive Metronome both synchronizes and increases the speed of our internal clock. This is important because current research in the field of "intelligence" and the neurosciences tells us that the faster our "internal clock" operates, the more we are able to reach our potential academically, professionally, socially, athletically…

Droit-Volet, S. & Wearden, J. (2002). Speeding up an internal clock in children? Effects of visual flicker on subjective duration. The Quarterly Journal of Experimental Psychology, 55B(3), 193-211.

Researchers have discovered that one way to further prove contemporary theory on human timing (i.e., scalar timing theory; pacemaker-accumulator model), is to manipulate "internal clock speed." In other words, they seek to make the brain operate faster or slower by asking individuals to complete specific repeated activities that over time have the effect of slowing down the internal clock or speeding it up. Here is yet another study (Penton-Voak et al., 1996) where the authors proved that the pace of our internal clock or what is otherwise known as our ability to think faster can be sped up. The authors mention something important in that to increase our cognitive speed, the stimulation must be repetitive and must engage attention. Interactive Metronome is patented brain training program that provides the right combination to increase mental speed and fitness.

Penton-Voak, I.S., Edwards, H., Percival, A., and Wearden, J.H. (1996). Speeding up and internal clock in humans? Effects of click trains on subjective duration. Journal of Experimental Psychology, 22(3), 307-320.

Scalar expectancy theory (SET) is one of the most popular current models of human timing. This article contains one of the simplest explanations of SET

that I have seen. Wearden (2008) suggests our brain keeps time via a pacemaker that starts pulsing at regular intervals as the brain receives information from the environment that is timed (i.e., when listening to someone speak). Speech contains many timed elements that must be separately interpreted and then integrated to distinguish between sounds, syllables, words and other information like intent of the speaker (serious? joking?). Each "pulse" is then collected by something called an "accumulator." The authors discuss how the pacemaker is switched on and off, how the accumulator starts and stops collecting the timed information based on the switching on and off of the pacemaker, and about the reference memories for time (or # of pulses) that are kept in memory and accessed in order to make a final determination (i.e., in the example I gave earlier, the decision would be about what is heard …did he say "burst" or "birth?"). Additionally, Wearden provided further evidence that the pace or speed of the brain's clock can be manipulated with specific activities that are repetitive and engage attention. The Interactive Metronome is a brain fitness tool that is used in the treatment of many developmental disorders, acquired brain injuries, progressive illnesses, and by those that are feeling the effect of aging or want an academic or athletic advantage. Through repetitive exercises aimed at synchronizing timing in the brain, individuals learn better focus, memory, and coordination.

Wearden, J.H. (2008). Slowing down an internal clock: Implications for accounts of performance on four timing tasks. The Quarterly Journal of Experimental Psychology, 61(2), 263-274.