Blink if your brain needs a rest

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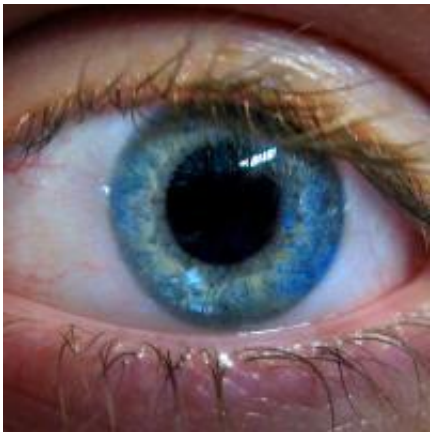

Why do we spend roughly 10 percent of our waking hours with our eyes closed - blinking far more often than is actually necessary to keep our eyeballs lubricated? Scientists have pried open the answer to this mystery, finding that the human brain uses that tiny moment of shut-eye to power down.

The mental break can last anywhere from a split second to a few seconds before attention is fully restored, researchers from Japan's Osaka University found. During that time, scans that track the ebb and flow of blood within the brain revealed that regions associated with paying close attention momentarily go offline. And in the brief break in attention, brain regions collectively identified as the "Default Mode Network" power up.

Discovered less than a decade ago, the default mode network is the brain's "idle" setting. In times when our attention is not required by a cognitive task such as reading or speaking, this far-flung cluster of brain regions comes alive, and our thoughts wander freely. In idle mode, however, our thoughts seldom stray far from home: We contemplate our feelings; we wonder what a friend meant by a recent comment; we consider something we did last week, or imagine what we'll do tomorrow.

Most of us take between 15 and 20 such moments of downtime per minute, and scientists have observed that most blinking takes place near or at the point of an "implicit stop": While reading or listening to another person, that generally comes at the end of a sentence; while watching a movie, for instance, we're most likely to blink when an actor turns to leave the scene or when the camera shifts to follow the dialogue.

The study, published this week in the journal *Proceedings of the National Academies of Science*, studied 20 healthy young subjects in a brain scanner as they watched "best bits" snippets from the British comedy "Mr. Bean." An earlier study had shown the researchers which implicit breakpoints in the "Mr. Bean" video most commonly elicited a spontaneous blink, so researchers knew when to look for changes in the brain's activation patterns.

Sure enough, when subjects blinked, the researchers detected a momentary stand-down within the brain's visual cortex and somatosensory cortex - both involved with processing visual stimuli - and in areas that govern attention. The circuitry of the Default Mode Network stepped up to fill the momentary lapse in attention, and then yielded again as order - and attention - was restored.

In a separate experiment, the researchers established that the momentary rest that blinking appears to represent is a deliberate act, and not just a

response to an absence of stimuli. When researchers inserted roughly nine 165 milliseconds of blank screentime per minute into the "Mr. Bean" video, subjects' Default Mode Network did not activate in response. Although the video gave them a blink's worth of time to rest, subjects did not recognize a breakpoint in the action, and therefore remained attentive.

Though the current study didn't examine the relationship between blinking and deception, others have: While telling a lie, liars have been found to blink less - possibly because the act of deception requires rapt and uninterrupted attention to pull it off. In the seconds after telling a lie, however, the liar will blink far more frequently than a truth-teller. Perhaps the resulting downtime is necessary for the liar to consider whether the deceived person was buying the fib - or whether it was worth telling in the first place.

More information: Paper: www.pnas.org/content/early/201 … 804110.abstract.html