

From teens' sleeping brains, the sound of growing maturity

March 22 2013, by Melissa Healy, Los Angeles Times

Listening in on the electrical currents of teenagers' brains during sleep, scientists have begun to hear the sound of growing maturity. It happens most intensively between the ages of 12 and 16 1/2: After years of frenzied fluctuation, the brain's electrical output during the deepest phase of sleep - the delta, or slow-wave phase, when a child's brain is undergoing its most restorative rest - becomes practically steady.

That reduced fluctuation in electroencephalogram signals during delta-phase sleep appears to coincide with what neuroscientists have described as major architectural changes in the brain that pave the way for cognitive maturity.

While babies, toddlers and young children are taking in and making sense of the world, their [brain cells](#) are wiring themselves together willy-nilly, creating super-dense networks of interwoven neurons. But as we reach and progress through adolescence, neuroscientists have observed, a period of intensive "synaptic pruning" occurs in which those networks are thinned and the strongest and most evolutionarily useful remain.

In a study published Monday in the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*, scientists from the University of California-Davis say they believe the slowed fluctuations observed during the delta phase of teens' sleep may be evidence of that pruning process at work.

And since major [mental illnesses](#) such as schizophrenia appear to take

root during adolescence, the authors of the study say the changing architecture of sleep revealed by EEG may offer clues as to how and when that process of neuronal pruning goes awry and mental illness sets in.

Their data - sleep studies of 98 children age 6 to 18, followed for as many as seven years - will become available to other researchers. Under a grant by the National Institute of Mental Health, the EEG records of the kids' sleep will be archived with the National Institutes' of Health's National Database for Autism Research.

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