striate and lateral prefrontal cortices. Braun et al. suggest REM provides an opportunity for visual and limbic cortices to process information in a manner dissociated from visual input from, and intentional output to, the external world.

Comment on: *Braun, A. R., Balkin, T. J., Wesensten, N. J., Gwadry. F., Carson, R. E., Varga, M., Baldwin, P., Belenky, G., and Herscovitch, P. (1998). Dissociated pattern of activity in visual cortices and their projections during human rapid eye movement sleep.* Science *279, 91-95.*

epacesch@bidmc.harvard.edu

EFFECTS OF SLEEP DEPRIVATION ON ATTENTION

By Logan Trujillo and David M. Schnyer

Using a standard cued-target task, we examined the effects of 24 hours of sleep deprivation (SD) on endogenous (internally-driven) and exogenous (externally-driven) shifts of selective visuospatial attention to task-relevant targets. For both types of attention shifts, SD slowed response times, decreased accuracy rates, and modulated intermediate and late target-locked event-related potential (ERP) brain responses. In contrast, an early ERP response was modulated with SD for endogenously cued targets only. These findings suggest that mild SD affects all stages of attention selection, but affects endogenous selective attention to a greater degree than exogenous selective attention.

Comment on: *Trujillo, L., Kornguth, S., and Schnyer, D. M. (2009). An ERP Examination of the Different Effects of Sleep Deprivation on Exogenously Cued and Endogenously Cued Attention.* Sleep *32, 1285-1297.*

trujillo@psy.utexas.edu
schnyer@psy.utexas.edu

IT REALLY IS BEST TO SLEEP ON IT

By Adrien Peyrache and Francesco P. Battaglia

Sleep is important for memory consolidation: the process that stabilizes memories after they are acquired. For this, information likely flows between hippocampus and neocortex as, respectively, the initial and final memory store. During sleep, hippocampus and neocortex replay experience-related neural patterns, possibly supporting this exchange. Peyrache et al. (2009) found that during slow-wave sleep, replay in the rat prefrontal cortex took place in transient rare events correlated with hippocampal activity bursts names sharp waves, themselves linked to replay. Replay dynamics was orchestrated by cortical slow oscillations. Further, patterns relative to rewarded task rules were preferentially replayed, hinting information triaging during consolidation.

Comment on: *Peyrache A., Khamassi M., Benchenane K., Wiener S. I., and Battaglia F. P. (2009). Replay of rule-learning related neural patterns in the prefrontal cortex during sleep.* Nat. Neurosci. *12, 919-926.*

adrien.peyrache@gmail.com
fpbattaglia@gmail.com

NOVEL MODEL TAKES A BROAD VIEW

By Knud Thomsen

The recently proposed Ouroboros Model, claimed to underlie efficient data processing in living brains, as well as for artificial agents, features at its core an iterative process where continual expectations derived from available knowledge are compared to actually encountered data. Sleep and dream are conceptualized as house keeping functions for maintaining appropriate signal/noise levels by actively disposing of inevitable "data garbage", i.e., activations which could not fully be assigned or resolved by the comparison stage.

Comment on: *Thomsen, K. (2008). The Ouroboros Model, BICA 08, Technical Report FS-08-04, Menlo Park, California: AAAI Press, Cogprints 6081, http://cogprints.org/6081/.*

knud.thomsen@psi.ch

HOW TO LEARN SLEEP BY HEART

By Anda Baharav and Yair Fuxman

Power spectral analysis of instantaneous heart rate fluctuations reveal components which are correlates of autonomic nervous system functions. These components display differential profiles in the different sleep stages, permitting classification of sleep stages from the electrocardiogram (Baharav et al., 1995). Based on these facts, we developed a sophisticated algorithm, the HC1000P, which permits conducting a sleep study based on a single ECG channel that can be automatically scored to obtain information on sleep architecture and efficiency, arousals, autonomic nervous function and respiratory function during sleep. Thus, the HC1000P provides a powerful new tool for the diagnosis of sleep disorders in general and sleep apnea in particular.

Comment on: *Baharav, A., Kotagal, S., Gibbons, V., Rubin, B. K., Pratt, G., Karin, J., and Akselrod, S. (1995). Fluctuations in autonomic nervous activity during sleep displayed by power spectrum analysis of heart rate variability.* Neurology *45, 1183-1187.*

abaharav@hypnocore.com
yfuxman@hypnocore.com

STRENGTHENING MEMORIES DURING SLEEP

By John D. Rudoy, Joel L. Voss, Carmen E. Westerberg and Ken A. Paller

Memory consolidation processes are active during sleep. Periods of sleep after encoding can benefit later recall, and reinstating the learning context during sleep can result in even greater benefits. Our study asked whether sounds could be used to reactivate specific memories during sleep, later enhancing retrieval of those memories during waking. While asleep, people heard a set of sounds, each linked with a visual object the location of which had been learned earlier. Upon waking, individuals recalled correct object locations more accurately for the cued objects than for control objects for which cues were not played during sleep. Thus, consolidation operates during sleep with high specificity and may be systematically influenced through auditory stimulation.

Comment on: *Rudoy, J. D., Voss, J. L., Westerberg, C. E., and Paller, K. A. (in press). Strengthening Individual Memories By Reactivating Them During Sleep.* Science.

j-rudoy@northwestern.edu
joelvoss@illinois.edu
c-westerberg@northwestern.edu
kap@northwestern.edu