

In This Issue

Desegregation

The extension of the dorsal and ventral streams into prefrontal cortex, and the partition of its working memory functions into spatial and object anatomical domains, is one of the more provocative and influential recent notions of brain organization. Bradley Postle and Mark D'Esposito (p. 585) tested the idea with fMRI. They find that delay-period activity was clearly anatomically segregated on the basis of task domain in more posterior cortical regions. But not in the PFC.

Russell's Paradox

And speaking of which: at this year's Summer Institute in Cognitive Neuroscience, Dick Passingham closed his discussion of task interference in the dorsal PFC with a line from the autobiography of the great twentieth-century mathematician Bertrand Russell. "I went out bicycling one afternoon," wrote Russell, "and suddenly, as I was riding along a countryroad I realized that I no longer loved Alys." Passingham remarked in jest that it was a wonder Russell hadn't fallen off his bicycle. Joking aside, if Russell had just been learning to ride a bike he might well have done. Ranganath and Paller's report (p. 598) addresses just such interference. They find that a frontal ERP that is strongly correlated with novelty detection is reduced in amplitude if the brain is simultaneously retrieving memories. The authors use the ERP as a signature for frontal involvement, and present their results in the context of the HERA model: the reduction was largely lateralized to the right hemisphere for, oddly, both episodic and semantic retrieval. But, more generally, what is it, exactly, about novel thoughts, planning, and other (frontal?) functions that cause them to interfere with one another? What do they have in common, and how can we understand them in terms of the wiring of the relevant pieces of the PFC?

What a Cute Little Snake

Amygdectomy is well known to cause generalized insouciance in nonhuman animals. Adolphs and Tranel (p. 610) extend this claim to humans as well. Having previously found amygdala-damaged subjects to be abnormally un-averse to untrustworthy-looking faces, here

they use abstract shapes and landscapes to find that this unaversion is not specific to the interpersonal realm.

Subtraction Images

Lesion studies have exposed the odd dissociability of different elementary mathematical abilities. With a powerful magnet, some working hypotheses, and eight healthy normals, Chochon and colleagues (p. 617) try to map out just what is being done where.

Two by Two

In an effort to disentangle the left hemisphere's propensity for verbal materials, and the right's for faces, from their supposed hegemonies in encoding and retrieval, respectively, McDermott et al. (p. 631) scanned subjects wrestling with all combinations of the two material types (words and faces) and tasks (encoding and retrieval). They find that, despite this attempt at separating variables, the right frontal pole favors retrieval, indicating perhaps that HERA cannot be explained on the basis of material type alone.

Smoothies, Saccades Share Substrates

Ample evidence suggests the interdependence of visual attention and saccadic target selection. Here Rich Krauzlis and colleagues (p. 641) use psychophysics to tie in smooth pursuit movements as well. Cuing subjects to either the form or location of upcoming targets to be saccade-captured and subsequently smooth-pursued, they demonstrate that red-herring cues that send the pursuit system in the wrong direction generally also catch the (slightly longer latency) saccades. Krauzlis et al. conclude that the two systems share attentional inputs but operate to some degree independently.

Nobody Home

With verbal report often tacitly used as a kind of symptom of consciousness—in studies of blindsight, for example—it is refreshing to be reminded that the two do not bear any necessary relation to each other at all. Isolated right hemispheres are glaring examples of patently con-

scious brain disconnected from the verbal machinery (as, of course, are mute humans, or indeed all nonhuman animals). Nicholas Schiff and colleagues (p. 650) recount a fascinating example of the contrapositive case: verbal machinery functioning entirely without consciousness. A patient, not quite comatose but showing no signs of anything resembling awareness, nonetheless blurts out words from time to time, Tourette's-style. The authors credit a spared "basal ganglia-thalamo-cortical re-entrant circuit."

Same Difference

Sentence comprehension entails the ongoing construction of an understanding, a construct successively adapted as the sentence unfolds, and which reacts to an unexpected or nonsensical twist in the sentence with a characteristic lurch in the EEG. Von Berkum et al. (p. 657) ran a nicely simple experiment to pin down whether this lurch also occurs in response to sentences that would be just fine in isolation, but that are bizarre and anomalous in the context of an ongoing story. They find that sentences that are only nonsensical given their context in the story, and sentences that are nonsensical regardless of context, induce the very same potential: a slow, posterior, right-dominant discrepancy alert. Weirdness is weirdness.

Gripping Drawers

Everyone knows that the cerebellum is A Very Important Thing, but what precisely it does has proven a slippery issue. Serrien and Wiesendanger (p. 672) demonstrate its role in both reacting to and anticipating loads. Setting unilateral cerebellar patients to pulling out a drawer, and comparing their affected and unaffected hands, Serrien and Wiesendanger dealt out both predictable and unpredictable perturbations to the drawer's trajectory. The patients' affected hands were relatively inept at dealing with both cases. A result anticipated by the authors? Or by their cerebella?

I Don't Know And I Don't Care

A case study in this issue (p. 682) considers a man whose exposure to carbon monoxide left him apathetic and amnesic, consistent with damage to the globus pallidus and hippocampus. Henke et al. followed him over the course of the subsequent year and a half as he recovered. While his motivation returned, the authors found that not all episodic memory functions recovered at the same rate; they suggest that this indicates an anatomical compartmentalization and, specifically, that the hippocampus is absolutely necessary for spatial learning.

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