Studies provide new insights into brain-behavior relationships

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Approximately half a million individuals suffer strokes in the US each year, and about one in five develops some form of post-stroke aphasia, the partial or total loss of the ability to communicate. By comparing different types of aphasia, investigators have been able to gain new insights into the normal cognitive processes underlying language, as well as the potential response to interventions. Their findings are published alongside papers on hemispatial neglect and related disorders in the January, 2013 issue of.

The January issue of *Behavioural Neurology*, edited by the journal's co-Editor in Chief, Argye E. Hillis, MD, of the Departments of Neurology, Physical Medicine and Rehabilitation, and Department of Cognitive Science, Johns Hopkins University, Baltimore, Maryland, features papers on two topics that have traditionally captured the interest of behavioral neurologists – aphasia and hemispatial neglect.

The first section on aphasia includes a number of papers that compare post-stroke aphasia with primary progressive aphasia (PPA), in which the predominant deficit is language (with or without apraxia).

Andreia V. Faria, MD, Department of Radiology, Johns Hopkins University School of Medicine, and colleagues from Johns Hopkins and University College, London, report patterns of dysgraphia (spelling impairment) in participants with primary progressive aphasia, and compare these patterns to those in participants with dysgraphia following stroke. They also report the areas of focal atrophy associated with the

most common pattern of dysgraphia in PPA and suggest this can not only provide a better understanding of the neural substrates of spelling, but may also provide clues to more effective treatment approaches.

Matthew A. Lambon Ralph, FRSLT (hons), FBPsS, and colleagues from the School of Psychological Sciences, University of Manchester, UK; the Department of Psychology, University of York, UK; and the Stroke and Dementia Research Centre, St George's University of London, UK, use a novel approach to explore nonverbal semantic processing to demonstrate the qualitative differences between semantic aphasia and semantic dementia. Their conclusions provide further support for the proposal that semantic cognition is underpinned by two principle components: semantic representations and regulatory control processes which regulate and shape activation within the semantic system.

Cynthia K. Thompson, PhD, and colleagues from the Department of Communication Sciences and Disorders, Department of Neurology, Cognitive Neurology and Alzheimer's Disease Center, and Department of Psychiatry and Behavioral Sciences at Northwestern University, Evanston, Illinois, evaluate the distinct patterns of morphological and syntactic errors in the variants of PPA, and compare them with patterns of errors in post-stroke aphasia.

Other papers compare treatment results of spelling in one individual with logopenic variant PPA (lvPPA) with an individual with post-stroke dysgraphia, and results of a new method of assessment of verbal and nonverbal memory in PPA. The issue is completed by three Clinical Notes including a fascinating case of an unusual form of lvPPA that degenerated into jargon aphasia, a case of nonfluent agrammatic variant PPA due to Pick disease with (what is argued to be) concomitant incidental Alzheimer's disease pathology, and a case of successful treatment of PPA.

"Together, these papers illustrate how investigating PPA and post-stroke aphasia can yield complementary insights about brain-behavior relationships as well as about potential response to interventions and the normal cognitive processes underlying language," says Dr Hillis.

Hemispatial neglect is characterized by reduced awareness of stimuli on one side of space. It occurs only after relatively focal (or at least asymmetric) brain damage, most commonly stroke, but is occasionally observed in other syndromes. In this second group of seven papers, Jonathan T. Kleinman, MD, of Johns Hopkins University School of Medicine, and Stanford University School of Medicine, Stanford, California, and colleagues from Johns Hopkins University School of Medicine, report an investigation of perseveration versus hemispatial neglect, and the lesion sites associated with each in acute stroke. The issue also includes an important paper by Junichi Ishizaki, PhD, and co-workers at the Department of Geriatric Behavioral Neurology, Tohoku University Graduate School of Medicine, Sendai, Japan, of impaired visual-spatial attention in Alzheimer's disease, which shows how a symmetric neurodegenerative disease results in impaired shifting of visual spatial attention, but not hemispatial neglect.

"Hemispatial neglect remains one of the most remarkable syndromes investigated by behavioral neurologists," comments Dr Hillis. "These novel studies of neglect and related disorders provide new insights into brain-behavior relationships on the basis of detailed analysis of patient performance – and in many cases, their lesion sites."

More information: Primary Progressive Aphasia and Post-Stroke Aphasia: Some Complementary Insights into Brain-Behavior Relationships/Hemispatial Neglect and Related Disorders Editor: Argye E. Hillis, MD, MA, Professor of Neurology, Departments of Neurology, Physical Medicine and Rehabilitation, and Department of Cognitive Science, Johns Hopkins University, Baltimore, Maryland

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