MSc Cognitive Neuropsychology

Disorders of Language Module

Spring Term, 2009

Convenor: Dr. Michael Thomas

Module Description

This module will contain topics on language breakdown following brain damage, and on language and speech disorders in development. The emphasis is on the types of deficits observed, for example, problems in sentence processing and in word finding, with special reference to how these inform our understanding of normal language processing. Both acquired and developmental disorders of language will be considered. Issues relating to brain imaging and to computational (connectionist) modelling of disorders will be treated in relation to specific processes. The module will include lectures, discussion of transcripts from patients, and seminars focusing on selected material.

Aims

The aims of this module are:

- To provide students with an overview of the main types of aphasia, including their historical origins
- To demonstrate how acquired deficits in language have been used to constrain theoretical models of language processing
- To demonstrate the relationship between acquired and developmental deficits of the language system
- To identify the contributions of new technologies to our understanding of language deficits, including neuroimaging and computational modelling
- To describe the recovery patterns at different ages following language deficits

Objectives

By the end of this course, students should be able:

- To describe the principal classes of aphasia and the processing models they support
- To outline the current debate in how such disorders inform our understanding of the structure and development of the normal language system
- To discuss current views of the link between the neural substrate and the cognitive level description of the adult language system
- To describe the contributions of different methodologies to studying language deficits, including behavioural studies, brain imaging, and computational modelling

Course Timetable

Disorders of Language, Spring 2009		
Lectures 11.30am to 1.00pm, Thursdays Room 534, Birkbeck College Main Building		
Wk1	Thursday 15th Jan	Introduction to aphasia and its basic forms
Wk2	Thursday 22nd Jan	Acquired Comprehension Deficits
Wk3	Thursday 29th Jan	Acquired Production Deficits
Wk4	Thursday 5th Feb	Dr. David Green: Aphasia in bilinguals
Wk5	Thursday 12th Feb	Prof. Sophie Scott: The neurobiology of speech perception
Wk6	Thursday 19th Feb	READING WEEK
Wk7	Thursday 26th Feb	Dr. Fiona Richardson: Neuroimaging and the architecture of the language system
Wk8	Thursday 5th March	Dr. Fiona Richardson: Connectionist models of language deficits
Wk9	Thursday 12th March	Dr. Jennifer Aydelott: Domain-general approaches to language disorders
Wk10	Thursday 19th March	Developmental disorders of the language system
Wk11	Thursday 26th March	The right hemisphere. Specialisation, plasticity, and recovery. Course Review.
Seminar 1	Date to be agreed (see note)	Category-specific deficits
Seminar 2	Date to be agreed (see note)	Specific Language Impairment

Note on the scheduling of seminars

The dates and times for the seminar will be agreed during the first lecture. Possible slots are Thursday 4.30-5.30pm on Thursday 5th February, Thursday 12th February, Thursday 26th February, Thursday 5th March and Thursday 19th March.

Handouts

Lecture handouts will be available as PDF files on my website the day before the relevant lecture:

http://www.psyc.bbk.ac.uk/people/academic/thomas_m/msccogneuro/handout_page.htm

Essay questions

(5.1) To what extent has brain imaging informed psychological models of language processing?

(5.2) What have computational models told us about the way the language system can break down?

(5.3) What does Broca's area do in the brain? How is this function related to the notion of a Broca's aphasic?

(5.4) What implication does the existence of Specific Language Impairment have for the genetic basis of language acquisition?

(5.5) Students may also propose their own essay question related to the domain of language disorders. The question must be agreed in advance with Dr. Thomas.

Disorders of Language: Reading List

General sources

Hillis, A. E. (2002). *The handbook of adult language disorders*. Sussex, Hove: Psychology Press.

Kolb, B. & Whishaw, I. Q. (2003). *Fundamentals of human neuropsychology 5th Edition*. New York: Worth Publishers. [Chapter 19]

Demonet, J-F, Thierry, G., & Cardebat, D. (2005). Renewal of the neurophysiology of language. *Physiological Review*, *85*, 49-95.

Bennett, M. R., & Hacker, P. M. S. (2008). *History of cognitive neuroscience*. Chichester, Sussex UK: Wiley-Blackwell. [Chapter 4]

Sources for specific topics

- **Broca's region**

Grodzinsky, Y. & Amunts, K. (2006). *Broca's region*. Oxford University Press.

Grodzinsky, Y., & Santi, A. (2008). The battle for Broca's region. *Trends in Cognitive Sciences*, *12(12)*, 474-480.

Schubotz, R. I., & Fiebach C. J. (2006). *Integrative models of Broca's area and the ventral premotor cortex*. Masson.

- **Semantic retrieval:**

Price, C. J., & Friston, K. J. (2002). Degeneracy and cognitive anatomy. *Trends in Cognitive Sciences*, *6(10),* 416-421.

- **Psycholinguistics and aphasia:**

Dick, F., Bates, E., Wulfeck, B., Aydelott Utman, J., Dronkers, N., & Gernsbacher, M. A. (2001). Language deficits, localization, and grammar: Evidence for a distributive model of language breakdown in aphasic patients and neurologically intact individuals. *Psychological Review*, *108(4)*, 759-788.

Dick, F., Wulfeck, B., Krupa-Kwiatkowski, & Bates (2004). The development of complex sentence interpretation in typically developing children compared with children with specific language impairments or early unilateral focal lesions. *Developmental Science*, *7(3)*, 360-377.

- **Category-specific deficits:**

Forde, E. M. E., & Humphreys, G. W. (2002). *Category specificity in brain and mind*. Hove, Sussex: Psychology Press.

Pulvermuller, F. (2001). Brain reflections of words and their meaning. *Trends in Cognitive Sciences*, *5(12)*, 517-524.

Shelton, J. R., & Caramazza, A. (2001). The organization of semantic memory. In. B. Rapp (ed.), *The handbook of cognitive neuropsychology* (p. 423-443). Sussex, Hove: Psychology Press.

- **Developmental disorders:**

Anderson, V., Northam, E., Hendy, J., & Wrennall, J. (2001). *Developmental neuropsychology: A clinical approach*. Sussex, Hove: Psychology Press. [Chapter 4]

Bates, E., & Roe, K. (2001). Language development in children with unilateral brain injury. In Nelson, C. A. & Luciana, M. (Eds.), *Handbook of developmental cognitive neuroscience* (p. 281-318). Cambridge, Mass.: MIT Press.

Thomas, M. S. C. (in press). Language acquisition in developmental disorders. To appear in: M. Kail, M. Hickmann & M. Fayol (Eds.), *Proceedings of the International Conference on First and Second Language Acquisition*, Paris 2006. (http://www.psyc.bbk.ac.uk/research/DNL/personalpages/thomas_paris.pdf)

- **Bilingual aphasia:**

Green, D. W. & Price, C. J. (2001). Functional imaging in the study of recovery patterns in bilingual aphasia. *Bilingualism: Language and Cognition*, *4*, 191-201.

Green, D. (2005). The neurocognition of recovery patterns in bilingual aphasics. In J. F. Kroll & A. M. B. De Groot (Eds.) *Handbook of bilingualism: psycholinguistic approaches* (p.516-530). Oxford: Oxford University Press.

- **Language in the right hemisphere**

Tomkins, C. A., Fassbinder, W., Lehman-Blake, M. T., & Baumgaertner, A., (2002). The nature and implications of right hemisphere language disorders. In. A. E. Hillis (Ed.) *The handbook of adult language disorders* (p. 429-448). Sussex, Hove: Psychology Press.

Andrews, D. (2001). *Neuropsychology: From theory to practice*. Psychology Press: Hove, Sussex. [Chapter 7].

- **Recovery and rehabilitation**

Andrews, D. (2001). *Neuropsychology: From theory to practice*. Psychology Press: Hove, Sussex. [Chapters 10, 11]

Semel, E. & Rosner, S. R. (2003). *Understanding Williams syndrome: Behavioral patterns and interventions*. Mahwah, New Jersey: Lawrence Erlbaum Associates. [Chapter 3]

Zillmer, E. A., Spiers, M. V., & Culbertson, W. C. (2008). *Principles of neuropsychology*. Belmont, CA: Wadsworth. [Chapter 13]

Mitchum, C. C., Haendiges, A. N., & Berndt, R. S. (1995). Treatment of thematic mapping in sentence comprehension: implications for normal processing. *Cognitive Neuropsychology*, *12*, 503-547. [Reprinted in Ellis & Young, 1996, p. 592-639]

Horton, S., & Byng, S. (2002). "Semantic therapy" in day-to-day clinical practice: Perspectives on diagnosis and therapy related to semantic impairments in aphasia. In. A. E. Hillis (Ed.), *The handbook of adult language disorders* (p. 229-249). Sussex, Hove: Psychology Press.

Small, S. L. (2002). Biological approaches to the treatment of aphasia. In. A. E. Hillis (Ed.), *The handbook of adult language disorders* (p. 397-411). Sussex, Hove: Psychology Press.

Seminar Readings

- **Seminar 1: Category-specific deficits**

Sartori, G., Job, R., & Zago, S. (2002). A case of domain-specific semantic deficits. In E. M. E. Forde & G. W. Humphreys (Eds.), *Category specificity in brain and mind* (p. 25-49). Hove, Sussex: Psychology Press.

Whatmough, C., & Chertkow, H. (2002). Category-specific recognition impairments in Alzheimer's disease. In E. M. E. Forde & G. W. Humphreys (Eds.), *Category specificity in brain and mind* (p. 181-210). Hove, Sussex: Psychology Press.

Gainotti, G. (2002). The relationships between anatomical and cognitive locus of lesion in category-specific disorders. In E. M. E. Forde & G. W. Humphreys (Eds.), *Category specificity in brain and mind* (p. 403-426). Hove, Sussex: Psychology Press.

Barsalou, L. W., Simmons, W. K, Barbey, A. K., & Wilson, C. D. (2003). Grounding conceptual knowledge in modality-specific systems. *Trends in Cognitive Sciences*, *7(2)*, 84-91.

- **Seminar 2: Specific Language Impairment**

Joanisse, M. F. (2004) Specific Language Impairments in children: Phonology, semantics and the English past tense. *Current Directions in Psychological Science*, *13(4)*, 156-160.

Tomblin, B. (in press). Children with Specific Language Impairment. To appear in E. Bavin (Ed.), *The handbook of child language*. Cambridge University Press.

van der Lely, H. K. J. (2004). Evidence for and implications of a domain-specific grammatical deficit. In Lyle Jenkins (Ed.), *The genetics of language. Linguistic Variations series*, (pp117-145). Elsevier, Oxford.

Ullman, M. T., & Pierpont, E. I. (2005). Specific language impairment in not specific to language: The Procedural Deficit hypothesis. *Cortex*, *41*, 399-433.

Groszer, M. et al. (2008). Impaired synaptic plasticity and motor learning in mice with a point mutation implicated in human speech deficits. *Current Biology*, *18*, 354–362.