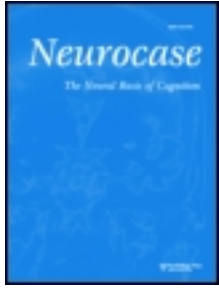


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Acquired phonological and deep dyslexia

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PREVIOUS CASES

Acquired Phonological and Deep Dyslexia

Matthew A. Lambon Ralph¹ and Naida L. Graham^{1,2}

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Aphasic patients with deep dyslexia present with a number of generally co-occurring features or symptoms (Coltheart, 1980a). Besides the principal characteristic — production of semantic paralexia (e.g., producing ‘talk’ to the target *speak*) — the features also include visual and derivational paralexia (e.g., *deep* → ‘deer’; *depth* → ‘deep’), function word substitutions (e.g., *her* → ‘she’), an almost complete inability to derive phonology directly from print (i.e., read non-words), reading accuracy is affected by imageability/concreteness (highly imageable/concrete better than low imageable/abstract words) and by the part of speech (typically, nouns > adjectives > verbs > functors). Deep dyslexia has been described most often in patients with Broca’s aphasia who have a severe expressive aphasia but relatively good comprehension, poor short-term memory and inability to manipulate phonological information. Writing is also impaired and some patients present with both deep dyslexia and dysgraphia (e.g., Nolan and Caramazza, 1983, P661). The critical feature of phonological dyslexia is the presence of a lexicality effect on reading accuracy (i.e., word > non-word reading). Many features listed above for deep dyslexia are found in patients with phonological dyslexia although this varies across individuals. In effect the presence of semantic paralexia is the differential diagnostic between phonological and deep dyslexia. Due to the potential overlap between these conditions, this brief overview encompasses the past cases of both deep and phonological dyslexia summarized in this issue, as well as the phonological dyslexic past cases that appeared previously (*Neurocase* 1995; 1: 251–7).

The first descriptions of phonological dyslexia argued that it should be considered as a separate type of dyslexia on the basis that a number of patients failed to show many of the symptoms of deep dyslexia (Beauvois and Dérouesné, 1979, P110). By studying the pattern of recovery in deep dyslexia and the pattern of symptoms across a series of phonological dyslexics, Friedman (1996, P641) has argued, however, that the two types of dyslexia reflect points along a continuum. At one end sits deep dyslexia with all its co-occurring symptoms. At the other, there is ‘pure’ phonological dyslexia with impoverished performance for non-words as the only reading deficit. In between are patients for whom the exact features of their phonological dyslexia are predictable on the basis of severity alone.

The most common view of deep dyslexia is that there is no sublexical computation of sound from print (i.e., non-word reading is impossible) and the limited reading that does occur is mediated via meaning (and most authors assume that there must be some impairment to the semantic route as well, see below). The absolute character of this assumption is called into question by some recent papers arguing for implicit activation of non-word pronunciations (e.g., Buchanan *et al.*, 1996, P629; Katz and Lanzoni, 1992, P650) and/or partial non-semantic reading to explain the different error patterns between naming and reading observed in patients with deep dyslexia (Southwood and Chatterjee, 1999, P687). We note, in this regard, that for a considerable number of the cases summarized here, non-word reading was very impaired but not completely abolished. It would seem reasonable to conclude, therefore, that there is some, albeit very limited, sublexical computation of sound from print in deep dyslexia. The same conclusion was reached by Patterson (1978, P667) after finding above-chance performance on a series of spoken-to-written non-word matching tests in two deep dyslexic subjects. Limited non-word reading/sublexical processing would also seem to add support to the notion of a continuum between phonological and deep dyslexia, assuming that this continuum is primarily governed by the degree of phonological impairment.

In recent years, a number of authors have begun to explore the possibility that reading is based upon primary, general processing systems and that the different types of acquired dyslexia reflect damage to one or more of these (for an overview, see Patterson and Lambon Ralph, 1999). Under this approach pure alexia reflects a visual impairment (Behrmann *et al.*, 1998), surface dyslexia follows a major reduction in the influence of semantic memory on phonology (Patterson and Hodges, 1992), and phonological dyslexia is due to a more generalized phonological impairment (Farah *et al.*, 1996 P639; Patterson and Marcel, 1992, P120). This hypothesis is strongly supported by the extremely high association between poor phonological awareness skills and phonological dyslexia (with the only exception seeming to be patient LB, Dérouesné and Beauvois, 1985, P113 — although we note, in turn, that this is one of only two cases with a right hemisphere lesion, see below). Can the same argument be extended to deep dyslexia,

or even perhaps, the phonological-deep continuum? Most explanations of deep dyslexia involve at least two functional impairments: (a) severely impaired direct activation of phonology from orthography (perhaps reflective of very impaired general phonological processing), and (b) disrupted activation of sound from print via meaning (Morton and Patterson, 1980) due to either impaired semantic memory or access to/egress from it (reflected in anomia and/or comprehension impairment).

The lesion sites and aetiologies associated with phonological dyslexia can be summarized as follows. Setting aside the hemispherectomy cases reported by Ogden (1996: P664), all patients had damage focused on the anterior perisylvian areas ranging from relatively circumscribed lesions typically of the left inferior, posterior frontal lobe to those patients with more extensive damage involving fronto-temporo-parietal areas. In the 37 papers on phonological dyslexia included in this review, seven exceptions to this pattern, with posterior left hemisphere lesions in and around the occipito-temporo-parietal junction, were identified (Beauvois and Dérouesné, 1979, P110, see also Dérouesné and Beauvois, 1979, P114; Caramazza *et al.*, 1985, patient AG – P112; Conway *et al.*, 1998, P633; Cuetos *et al.*, 1996; Friedman *et al.*, 1993, P642; Funnell, 1987, P118; Rapsack *et al.*, 1987, P121). There were also two cases with right hemisphere lesions (Dérouesné and Beauvois, 1985, P113; Patterson, 1982, P119). Aetiology in these cases is dominated by various forms of cerebrovascular accident with four exceptions (Pick's disease — Farah *et al.*, 1996, P639; hemispherectomy — Ogden 1996, P664; Alzheimer's disease — Raymer and Berndt, 1996, P674; head injury — Shallice and Warrington, 1980, patient GRN — P122).

For the past cases with deep dyslexia, the lesion site is the same as that typically found in patients with phonological dyslexia, i.e. the left fronto-temporo-parietal region, except that the lesion is typically larger, encompassing at least the perisylvian area and often extending to include much of the left hemisphere. In the 48 articles summarized here there were only four patients with a different lesion pattern: two (right-handed) patients had a right hemisphere lesion (Nolan *et al.*, 1997, P663; Sartori *et al.*, 1984, P680); the left hemispherectomy case of Patterson *et al.* (1989, patient — NI, P671); and a patient with a posterior callosal lesion who exhibited deep dyslexic behaviour if words were presented to his left visual field (Michel *et al.*, 1996, P658). Again, like the phonological dyslexics, deep dyslexia arose from various forms of cerebrovascular accident in the majority but there was also a minority (nine) with severe lesions following head injury. In addition, there was one case with an intracerebral abscess (Warrington and Shallice, 1979, P689) and four individuals with missile wounds, including the two cases that appeared in the seminal Marshall and Newcombe paper (1973, P656; see also patient MM, Caramazza *et al.*, 1981, P631; and patient WS, Saffran, 1980, P678). We note in passing that degenerative diseases are notable by their absence. In the 85 articles covered here, there are only two cases with dementia and phonological dyslexia, and no progressive patients with deep dyslexia.

Should such cases be identified, it would be interesting to know how closely the longitudinal decline mirrored the pattern of recovery seen in some deep dyslexic patients following acute brain injury (Friedman, 1996, P643).

The large lesions typically found in deep dyslexia provide one of the motivations behind the 'right hemisphere hypothesis' which assumes that the residual reading abilities observed in deep dyslexia are underpinned by processes in the right hemisphere (Coltheart, 1980b, Saffran *et al.*, 1980). The literature provides neuropsychological and neuroimaging data both for and against this hypothesis. One of the most highly cited papers reports the case of a 13 year old patient, NI, who following a complete left hemispherectomy presented with a pattern of dyslexia very similar to adult deep dyslexics (Patterson *et al.*, 1989). Given that the left hemispherectomy was complete, and assuming that after 13 years the neural-functional components of the reading architecture closely resemble those found in adulthood, this evidence clearly supports the right hemisphere hypothesis. Similar support can be found in a patient following posterior callosal lesion who read normally if words were presented to his right visual field but exhibited a deep dyslexic pattern when the words were presented in his left visual field (Michel *et al.*, 1996, P658). There are also claims for at least one case that goes against the right hemisphere hypothesis (Roeltgen, 1987, P676). After the first CVA, the patient presented with deep dyslexia but following a second lesion to the left frontoparietal region he had almost no residual reading ability. This would seem to support the alternative hypothesis that the poor reading of deep dyslexics reflects the residual capacities of the left hemisphere. This case is, unfortunately, complicated by the fact that one of these strokes gave rise to a right inferior frontal lesion, although Roeltgen argues from scanning and behavioural data that the right hemisphere lesion occurred as a result of the first stroke. Given that after these series of strokes the patient lost much of his speech as well, it is impossible to reject the alternative notion that his deep dyslexic pattern remained but was masked by a general output deficit. Two recent neuroimaging studies with three deep dyslexic patients (Price *et al.*, 1998, P673; Weekes *et al.*, 1997, P690) also disagree on this issue. Weekes *et al.* (1997) found greater right than left hemisphere activation in a deep dyslexic subject (three other subjects, one a surface dyslexic, demonstrated greater left than right activation) during word recognition, but more left than right activation during word production. Weekes *et al.* (1997) concluded in favour of the right hemisphere hypothesis and suggested that the process of word recognition was (abnormally) taking part in the right hemisphere. Price *et al.* (1998) compared two deep dyslexic patients with six normal controls. The two patients showed normal or enhanced activity in the spared left hemisphere regions that are associated with naming and comprehending words in intact subjects — consequently, Price *et al.* (1998) concluded that the impoverished reading of deep dyslexia reflects residual processing in these areas. Both patients also showed enhanced activation of regions in the right hemisphere, but Price *et al.* (1998) argued that although these may have

contributed to the patients' reading performance, the deep dyslexic pattern finds a sufficient explanation in the residual activation found in the left hemisphere of each patient (though for a different view of the same data, see Coltheart, 2000).

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Articulatory processes and phonologic dyslexia

J. C. Adair, R. L. Schwartz, D. J. Williamson, A. M. Raymer and K. M. Heilman

Abstract

Grapheme-to-phoneme conversion (GPC) allows the pronunciation of non-word letter strings and of real words with which the literate reader has no previous experience. Although cross-modal association between visual (orthographic) and auditory (phonemic-input) representations may contribute to GPC, many cases of deep or phonologic alexia result from injury to anterior perisylvian regions. Thus, GPC may rely upon associations between orthographic and articulatory (phonemic-output) representations. Detailed analysis of a patient with phonologic alexia suggests that defective knowledge of the position and motion of the articulatory apparatus might contribute to impaired transcoding from letters to sounds.

Journal

Neuropsychiatry, Neuropsychology, and Behavioral Neurology 1999; 12: 121-7

Neurocase Reference Number:

P623

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

Not mentioned

Key theoretical issue

- Defective knowledge about position and movements of the articulatory apparatus required for generation of phonemes may contribute to impaired non-word reading in phonological dyslexia

Key words: phonological dyslexia; articulatory awareness

Scan, EEG and related measures

CT, SPECT, MRI

Standardized assessment

Western Aphasia Battery, Boston Naming Test, Florida Apraxia Battery, verbal fluency, Battery of Adult Reading Functions, Woodcock-Johnson Achievement Test, digit span, Auditory Discrimination in Depth Test

Other assessment

Word segmentation task, letter-to-sound conversion, matching spoken phonemes to graphemes, non-word repetition, non-word spelling, phoneme blending, conversion of speech sounds to letters, matching phonemes to drawings indicating the position of the articulatory apparatus during the production of a specific phoneme

Lesion location

- Anterior perisylvian region of the left hemisphere
- CT: Border zone ischaemia between the left anterior and middle cerebral arteries
- MRI: Focal atrophy in the left inferior frontal and superior temporal region
- SPECT: Small focus of hypoperfusion in the left anterior perisylvian region, corresponding to the location of the abnormality on the MRI, reduced flow in the subjacent basal ganglia, and crossed cerebellar diaschisis in the right cerebellar hemisphere

Lesion type

Ischaemic

Language

English

Deep dyslexia and dysgraphia in a Broca's aphasic

V. Balasubramanian

Abstract

The present study described deep dyslexia in a Broca's aphasic and discusses the symptoms of this client in the context of the patient's overall linguistic impairments. The need for such investigation was identified in previous studies (Friedman and Perlman, 1982, P640). This study further explores the possibility that cases with relatively less extensive lesions of the left hemisphere will not evidence the prototypic syndrome of deep dyslexia reported in earlier literature.

Journal

Brain and Language 1996; 55: 115-8

Neurocase Reference Number:

P624

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

LK

Key theoretical issue

- Does deep dyslexia reflect more generalized linguistic deficits? Do the symptoms of deep dyslexia vary in line with lesion extent?

Key words: deep dyslexia; aphasia; lesion extent

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination, Apraxia Battery for Adults, Reading Comprehension Battery for Aphasia, Shortened Token test, PALPA

Other assessment

Word and non-word reading and writing to dictation

Lesion location

- Left temporal region extending up into the left frontal lobe

Lesion type

Not mentioned

Language

English

Semantic errors of naming, reading, writing, and drawing following left-hemisphere infarction

A. Beaton, J. Guest and V. Rajul

Abstract

This paper reports findings on the picture naming, reading, and drawing performance following left-hemisphere infarction. The patient was a 57-year-old right-handed female who exhibited deep dyslexia/dysgraphia. On a number of occasions, she showed discrepancies between her drawing and a reading or writing response to the same stimulus word. This patient sometimes gave virtually simultaneous, but different, oral and written responses in naming a picture. These discrepancies are interpreted as providing support for the view that semantic errors can arise at the level of selection of items from the phonological and orthographic output lexicons (as well as at the level of semantics). An alternative explanation is that they reflect moment-to-moment random fluctuation in levels of activation of representations within the semantic system. Semantic errors made in reading aloud, writing to dictation and oral/written naming are appended.

Journal

Cognitive Neuropsychology 1997; 14: 459–78

Neurocase Reference Number:

P625

Primary diagnosis of interest

Deep dyslexia, deep dysgraphia

Author's designation of case

MGK

Key theoretical issue

- The patient's semantic errors in naming, reading and writing arise from an impairment in the semantic system. Discrepancies across modalities on the same item could arise at the level of the output mechanisms, or may reflect fluctuations in the activation of semantic representations

Key words: deep dyslexia; deep dysgraphia; anomia; semantic impairment

Scan, EEG and related measures

CT

Standardized assessment

Western Aphasia Battery, PALPA

Other assessment

Auditory lexical decision, non-word repetition, object decision, letter case conversion, letter-sound conversion, copying words and non-words, reading words and non-words, writing words to dictation, oral and written picture naming, drawing

Lesion location

- CT: left fronto-parietal-temporal cortex, in the territory of the left middle cerebral artery. Two further CVAs occurred subsequent to the study

Lesion type

Ischaemic

Language

English

An investigation of non-lexical reading impairments

R. S. Berndt, A. N. Haendiges, C. C. Mitchum and S. C. Wayland

Abstract

Word and non-word reading ability was tested in a group of 11 patients with varying levels of language impairments. For the least impaired patients, the probability of grapheme-phoneme association affected non-word reading ability. An advantage reading non-words that sound like words (pseudo-homophones) was found for six patients, and was unrelated to the severity of patients' non-lexical reading impairments. All patients showed evidence of impairment to all three processing components hypothesized to be necessary for non-lexical reading. A focused study of the phonological processing abilities of the five subjects with mildest impairment uncovered differential influences of segment size and lexicality on patients' ability to combine aurally presented sound segments. Results are interpreted as indicating multiple sources of impairment to a number of cognitive operations that are specialized to support non-lexical reading.

Journal

Cognitive Neuropsychology 1996; 13: 763–801

Neurocase Reference Number:

P626

Primary diagnosis of interest

Deep and phonological dyslexia

Author's designation of case

EA, FM, ML, MF, MB, RP, JD, HC, JH, BK, WE

Key theoretical issue

- The underlying cause(s) of impaired non-word reading

Key words: phonological dyslexia; deep dyslexia; non-word reading

Scan, EEG and related measures

Not mentioned

Standardized assessment

PALPA

Other assessment

Word and non-word reading. Consonant and vowel sounding. Spoken-written word and non-word matching. Word and non-word homophony judgement. Phoneme deletion and blending. Phoneme discrimination. Bi-phoneme and syllabic blending. Digit span. Word and non-word recall

Lesion location

- Left hemisphere

Lesion type

CVA

Language

English

Residual ability to use grapheme-phoneme conversion rules in phonological dyslexia

V. A. Bradley and M. E. Thomson

Abstract

Describes a case of acquired phonological dyslexia in a 36-year-old right-handed man who suffered a myocardial infarct and a cerebral infarction in the left frontal region. The patient was encouraged to read non-words by analogy with real words, that is, by changing phonemes in real words to produce pronounceable non-words. The patient's demonstrated ability to perform this task suggests that he retained some ability to use grapheme-phoneme conversion rules. On the basis of the patient's performance, an additional connection in Morton's (Cognitive processes in spelling, New York: Academic Press, 1981) logogen model is postulated.

Journal

Brain and Language 1984; 22: 292-302

Neurocase Reference Number:

P627

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

PM

Key theoretical issue

- Can phonological dyslexics read non-words by analogy with read words?

Key words: phonological dyslexia; reading by analogy

Scan, EEG and related measures

Not mentioned

Standardized assessment

Boston Diagnostic Aphasia Examination, WAIS

Other assessment

Word, non-word and letter reading and writing to dictation. Non-word-non-word homophony judgement

Lesion location

- Left frontal cerebral infarction

Lesion type

Mural thrombosis

Language

English

Phonological processing of non-words by a deep dyslexic patient: a rowse is implicitly a rose

L. Buchanan, N. Hildebrandt and

G. E. MacKinnon

Abstract

Recent work has shown that implicit phonological knowledge plays a role in the word recognition performance of deep dyslexics. The results of the current study extend this examination to include the investigation of implicit knowledge of non-word phonology. The data from two lexical decision tasks indicate that non-word phonology is available for processing by a deep dyslexic patient in that she produced a significant pseudo-homophone effect as well as semantic priming with pseudo-homophone primes in lexical decision.

Journal

Journal of Neurolinguistics 1994; 8: 163-81

Neurocase Reference Number:

P628

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

JC

Key theoretical issue

- Is there implicit activation of phonology from print in deep dyslexia?

Key words: deep dyslexia; implicit activation; non-word reading

Scan, EEG and related measures

Not mentioned

Standardized assessment

Not mentioned

Other assessment

Word and non-word reading, lexical decision, phonological priming tasks

Lesion location

- Left fronto-parietal region

Lesion type

Haemorrhage

Language

English

Phonological processing of non-words in deep dyslexia: typical and independent?

L. Buchanan, N. Hildebrandt and
G. E. MacKinnon

Abstract

Patients with acquired deep dyslexia are unable to read non-words aloud. The deficit has therefore been attributed to damage in non-lexical phonological processing. Buchanan *et al.* (1994, P628) demonstrated that a deep dyslexic patient could process non-word phonology in two implicit tests. The generality of this claim is examined by replicating the Buchanan *et al.* experiments with two other deep dyslexic patients. Dissociations between lexical and non-lexical processing are examined by manipulating non-word phonology in a task that does not require lexical analysis. The results suggest that sensitivity to non-word phonology in deep dyslexia is common and is distinct from purely lexical analysis.

Journal

Journal of Neurolinguistics 1996; 9: 113–33

Neurocase Reference Number:

P629

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

GZ, PB

Key theoretical issue

- Ability of deep dyslexics to derive phonology from print sublexically

Key words: deep dyslexia; sublexical reading

Other assessment

Cross case matching, visual lexical decision, reading words and non-words

Lesion location

- Not mentioned

Lesion type

Aneurysm in the middle cerebral artery

Language

English

Bilingual biscriptal deep dyslexia

S. Byng, M. Coltheart, J. Masterson, M. Prior
and J. Riddoch

Abstract

Describes a case of deep dyslexia in a 15-year-old, right-handed male patient who pre-morbidly could read English and Nepalese. As the latter is written in the syllabic Devanagari script, this case explores the generality of the contention that reading, which depends on the mapping of characters onto phonological segments (phonemes or syllables), is impossible in deep dyslexia. It was hypothesized that reading Nepalese words written in the syllabic script would be more difficult than reading English words written in the Roman alphabet. In oral reading tasks, this proved to be the case, even though Nepalese was the patient's first language. However, further tests showed that the patient could understand Nepalese words written in the syllabic script at least as well as English words written in the Roman alphabet, and that he could read aloud Nepalese words written in the Devanagari script, provided he was allowed to respond in English. In addition, naming of pictures was much worse in Nepalese than in English. It is suggested that patient's difficulties in reading Nepalese aloud were output difficulties, not difficulties in reading a syllabic script. It is argued that the superiority of expressive speech in English over expressive speech in Nepalese arose because the patient had had intensive speech therapy in English and no speech therapy in Nepalese. Results contrast findings obtained from Japanese cases of deep dyslexia; differences in the respective syllabaries are examined.

Journal

Quarterly Journal of Experimental Psychology: Human Experimental Psychology 1984; 36A: 417–33

Neurocase Reference Number:

P630

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

B

Key theoretical issue

- The nature of deep dyslexia in a bilingual subject reading syllabic and Roman scripts

Key words: deep dyslexia; bilingual; syllabic script; Devanagari; Nepalese

Scan, EEG and related measures

CT

Standardized assessment

Not mentioned

Other assessment

Tasks completed with English script/presentation: word, non-word and letter reading; visual lexical decision; picture–word matching; rhyme judgement triads; writing to dictation; digit span. Devanagari testing: word and character reading; visual lexical decision; picture naming; writing to dictation. English to Devanagari, and Devanagari to English translation

Lesion location

- Extensive area of damage involving parietal and temporal lobes

Lesion type

Head injury

Language

English

'Agrammatic' reading

A. Caramazza, R. S. Berndt and J. Hart

Abstract

This chapter investigates the nature of reading in agrammatic, Broca type patients across single words and short sentences, and relates their reading to the expected pattern that follows from consideration of their wider grammatical deficits — that is agrammatic comprehension and speech production.

Journal

In: Pirozzolo FJ, Wittrock MC, editors. *Neuropsychological and Cognitive Processes in Reading*. New York: Academic Press, 1981

Neurocase Reference Number:

P631

Primary diagnosis of interest

Agrammatic, Broca aphasic

Author's designation of case

BD, BL, MM, HB

Key theoretical issue

- The relationship between reading and acquired language deficits

Key words: agrammatism; Broca's aphasia; phonological and deep dyslexia; sentence reading

Scan, EEG and related measures

MM, HB — CT

Standardized assessment

Boston Diagnostic Aphasia Examination

Other assessment

Word, non-word and sentence reading

Lesion location

- BD, BL — not mentioned
- MM — left hemisphere cortical damage to the frontal and temporal lobes
- HB — large left frontal lobe lesion, a small deep lesion of the left superior temporal gyrus, and a small lesion of the frontal lobe of the right hemisphere

Lesion type

BD, BL — CVA
MM — gunshot wound
HB — aneurysm

Language

English

Number words and number non-words. A case of deep dyslexia extending to Arabic numerals

L. Cohen, S. Dehaene and P. Verstichel

Abstract

Although the ability to process numerical symbols may be considered a special case of more general linguistic abilities, deficits affecting numbers and words are usually interpreted within entirely independent frameworks. The authors report a patient presenting typical deep dyslexia, as confirmed in a series of word and non-word reading tasks. Moreover, the main features of his deficit extended to Arabic numerals. The patient was equally unable to read aloud non-words and unfamiliar numerals, whereas he performed significantly better with real words and familiar Arabic numerals such as famous dates or brands of cars. Additionally, familiar numerals and words yielded qualitatively similar errors, as did unfamiliar numerals and non-words. This contrasting performance with familiar and unfamiliar numerals seems incompatible with any single-route model of number reading. It is rather consistent with the existence of two routes for number reading: a 'surface' route mapping any digit string into a word sequence according to language-specific rules; and a 'deep' semantic route functioning only with familiar items that possess a specific lexical entry. The authors therefore suggest that number reading is architecturally similar to word reading, although these two processes probably rest on functionally and anatomically distinct pathways.

Journal

Brain 1994; 117: 267–79

Neurocase Reference Number:

P632

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

Not mentioned

Key theoretical issue

- Nature of Arabic number reading in a case of deep dyslexia

Key words: number reading; deep dyslexia

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination

Other assessment

Word, non-word and Arabic numeral reading. Visual lexical decision. Picture naming. Number comprehension and matching. Verification of written additions

Lesion location

- CT (on submission) — Extensive left hemispheric subdural haemorrhage with subfalcial cerebral herniation
- CT (18 month post onset) — extensive hypodense area involving most of the lateral aspect of the posterior half of the left hemisphere

Lesion type

Head injury

Language

English

Treatment of a case of phonological alexia with agraphia using the Auditory Discrimination in Depth (ADD) programme

T. W. Conway, P. Heilman, L. J. Rothi,
A. W. Alexander, J. Adair, B. A. Crosson and
K. M. Heilman

Abstract

Phonological alexia and agraphia are acquired disorders characterized by an impaired ability to convert graphemes to phonemes (alexia) or phonemes to graphemes (agraphia). These disorders result in phonological errors typified by adding, omitting, shifting, or repeating phonemes in words during reading or graphemes when spelling. In developmental dyslexia, similar phonological errors are believed to result from deficient phonological awareness, an oral language skill that manifests itself in the ability to notice, think about, or manipulate the individual sounds in words. The Auditory Discrimination in Depth (ADD) programme has been reported to train phonological awareness in developmental dyslexia and dysgraphia. The authors used a multiple-probe design to evaluate the ADD programme's effectiveness with a patient with a mild phonological alexia and mixed agraphia following a left hemisphere infarction. Large gains in phonological awareness, reading and spelling non-words, and reading and spelling real words were demonstrated. A follow-up reassessment, 2 months post-treatment, found the patient had maintained treatment gains in phonological awareness and reading, and attained additional improvement in real word reading.

Journal

Journal of the International Neuropsychological Society 1998; 4: 608–20

Neurocase Reference Number:

P633

Primary diagnosis of interest

Phonological dyslexia, mixed dysgraphia

Author's designation of case

GK

Key theoretical issue

- The Auditory Discrimination in Depth training programme led to improvements in reading and spelling in a patient with phonological dyslexia and mixed dysgraphia. Improved phonological awareness was associated with improved non-lexical reading and spelling

Key words: phonological dyslexia; non-word and exception word spelling impairment; therapy

Scan, EEG and related measures

MRI

Standardized assessment

Woodcock–Johnson Tests of Achievement, Battery of Adult Reading Function, Aphasia Diagnostic Profile, WAIS-R, Boston Naming Test, Peabody Picture Vocabulary Test-Revised, Goldman–Fristoe–Woodcock Test of Auditory Discrimination, Lindamood Auditory Conceptualization Test, Lindamood Auditory Conceptualization Test — Multisyllable Auditory Conceptualization, Woodcock Reading Mastery Test-Revised, Wide Range Achievement Test

Other assessment

None mentioned

Lesion location

- MRI: Posterior two-thirds of the left temporal lobe, portions of the inferior parietal and occipital lobes including the angular and supramarginal as well as Wernicke's and Heschyl's gyri

Lesion type

Infarction

Language

English

Reading: dissociation of the lexical and phonologic mechanisms

H. B. Coslett, L. J. Gonzalez-Rothi and
K. M. Heilman

Abstract

Describes the case of a 53-year-old male patient who had an infarction that partially isolated the perisylvian speech areas and disconnected the partially preserved lexical systems from the phonologic mechanism. He read visually presented orthographically irregular words, but could not pronounce orally spelled irregular words. Although he could not read non-words, he could pronounce orally spelled non-words and orthographically regular words. These observations suggest that the lexical and phonologic conversion systems are functionally and anatomically distinct.

Journal

Brain and Language 1985; 24: 20–35

Neurocase Reference Number:

P634

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

Not mentioned

Key theoretical issue

- Patient presented with deep dyslexia when reading visual presented words, but surface dyslexia for 'reading' orally spelt words

Key words: deep dyslexia; surface dyslexia

Scan, EEG and related measures

CT and EEG

Standardized assessment

Western Aphasia Battery

Other assessment

Word and non-word reading of visually and orally presented words. Letter naming

Lesion location

- Poorly demarcated area of lucency on the left in the subcortical white matter, which was visible in the high ventricular and supraventricular sections

Lesion type

Probable 'watershed' infarction of the left hemisphere

Language

English

Deep dyslexia and the right hemisphere hypothesis: spoken and written language after extensive left hemisphere lesion in a 12-year-old boy

G. Cossu, E. da-Prati and J. C. Marshall

Abstract

The subject of this study was a right-handed Italian boy who sustained extensive left hemisphere damage after a massive subarachnoid haemorrhage at age 12 years; the right hemisphere was fully intact. Two years later, he had residual anomic aphasia with good sentence construction and comprehension of speech. His reading aloud showed all the characteristics of deep dyslexia, although some minimal ability to read pseudo-words remained. Writing and spelling were severely impaired, but without clear qualitative signs of deep dysgraphia. The overall pattern of performance is discussed with regard to the written language capacity of the non-dominant right hemisphere and its contribution to normal reading. The authors conclude that in this case (and perhaps some other cases of acquired deep dyslexia), reading and writing may be mediated by a combination of left and right hemisphere sites.

Journal

Cognitive Neuropsychology 1995; 12: 391–407

Neurocase Reference Number:

P635

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

SG

Key theoretical issue

- Deep dyslexia and the role of the right hemisphere

Key words: deep dyslexia; right hemisphere hypothesis

Scan, EEG and related measures

CT, angiography, MRI

Standardized assessment

WISC, Corsi blocks, Peabody Picture Vocabulary Test, Token test, Boston Naming Test

Other assessment

Word repetition. Syntactical comprehension. Word, non-word and letter reading. Cross-case matching. Visual lexical decision. Spoken-written non-word matching. Word and non-word writing to dictation. Written picture naming. Drawing from written name. Phoneme counting, blending and deletion. Oral spelling

Lesion location

- CT (on admission) — massive subarachnoid haemorrhage with an intracerebral left temporo-parietal haematoma
- CT (one month post onset) — hypodensity in fronto-temporo-parietal areas due to infarction
- MRI (2 years post onset) — large area of left hemisphere damage affecting posterior frontal cortex, insular cortex, the underlying globus pallidus and putamen, and the internal capsule. The damage is associated with an atrophic enlargement of the left lateral ventricle and atrophy of the left cerebral pedunculus. Superior temporal regions are affected with sparing of the middle and inferior areas. The angular gyrus and the supramarginal gyrus are spared. On the periphery of the lesion in the parietal area, there are clear signs of gliosis.

Lesion type

Haemorrhage

Language

English

A case of phonological dyslexia in Spanish

C. Fernando, F. Valle-Arroyo and M. P. Suarez

Abstract

A case study of a Spanish-speaking patient with spared lexical reading and considerable difficulty reading non-words is presented in this paper. AD suffered a CVA, and 3 months later was administered several tests of the Spanish version of PALPA. Although his word reading was around 90% correct, non-word reading reached only 34% correct, non-word-non-word substitutions being the most frequent type of error. In word reading no effects of frequency, grammatical class, or imageability were found. Word recognition and comprehension were within the normal range, as were speech production and repetition. A series of tasks, developed to investigate the processes hypothesized to be involved in the non-lexical route, showed that the only problem was in phoneme assembly. The implications of this pattern of results in a reader of an orthographically transparent language are discussed with regard to current models of oral reading.

Journal

Cognitive Neuropsychology 1996; 13: 1–24

Neurocase Reference Number:

P636

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

AD

Key theoretical issue

- Presentation of phonological dyslexia in an orthographically transparent language (Spanish)

Key words: Spanish; phonological dyslexia

Scan, EEG and related measures

CT

Standardized assessment

Not mentioned

Other assessment

Word, non-word, pseudo-homophone, letter, syllable and sentence reading. Visual lexical decision. Picture naming. Word and non-word repetition. Written word definition, synonym judgement, word-picture matching. Orthographic, syllabic and phonemic segmentation. Word and non-word phonemic blending

Lesion location

- Right hemisphere lacunar image. Area of subcortical-cortical ischaemia at parietal occipital level, on the left

Lesion type

CVA

Language

English

Rapid recovery of aphasia and deep dyslexia after cerebrovascular left-hemisphere damage in childhood

R. De Bleser, J. Faiss and M. Schwarz

Abstract

This paper reports a case of acquired language impairment in an 8.5-year-old right-handed Belgian boy (BV). He had normally acquired his native language (Flemish/Belgian Dutch) as well as a second language (French), and he was a very good pupil in school. Following a vascular accident in the left hemisphere, the patient initially presented a pure pattern of deep dyslexia associated with a non-fluent aphasia with phonemic paraphasias. The deep dyslexic symptoms disappeared within 6 weeks, and the aphasic impairments were no longer observable after 4.5 months. One year after the cerebrovascular accident, the boy reached top-level academic records in school. The initial combination of a transient deep dyslexia and subsequent rapid recovery from aphasia is discussed with reference to theories on right hemisphere reading in deep dyslexia and inter-hemispheric linguistic transferability. Results of functional magnetic resonance spectroscopy taken during speech stimulation 1 year post-onset do not support the notion that rapid recovery in this case of childhood aphasia was due to a right hemisphere take-over of language.

Journal

Journal of Neurolinguistics 1995; 9: 9–22

Neurocase Reference Number:

P637

Primary diagnosis of interest

Childhood deep dyslexia and non-fluent aphasia

Author's designation of case

BV

Key theoretical issue

- Pattern of language/reading recovery after CVA during childhood. Role of the right hemisphere

Key words: childhood CVA; deep dyslexia; non-fluent aphasia; right hemisphere

Scan, EEG and related measures

Transfemoral angiography, CT

Standardized assessment

Aachen Aphasia Test

Other assessment

Spoken and written word/non-word discrimination. Visual and spoken lexical decision. Word and non-word reading and repetition. Picture naming

Lesion location

- CT (one day post onset) — large left hemisphere vascular lesion in the territory of the middle cerebral artery
- CT (three days post onset) — low density areas in the left basal ganglia, the frontal operculum, and the subcortical precentral area

Lesion type

- Subtotal embolic occlusion of the right internal carotid artery and an embolism of the left middle cerebral artery

Language

English

How does a phonological dyslexic read words she has never seen?

G. Denes, L. Cipolotti and C. Semenza

Abstract

A 49-year-old Italian phonological dyslexic (PD) patient who speaks Italian and Friulan dialect is described. Her performance in reading Friulan was not as good as her reading of Italian words but substantially better than her non-word reading. It is suggested that she reads dialect words less well than Italian words because no orthographic entry is represented for dialect words in PD patients, since there has been no previous exposure to dialect in the written modality. The advantage shown for reading of dialect words over non-words may have several explanations: information coming from the phonological output lexicon would enhance the phonological assembly of real dialect words, or the helping information could come again from the phonological output lexicon or from a store consisting of potential graphemic forms generated by long auditory exposure to a word.

Journal

Cognitive Neuropsychology 1987; 4: 11–31

Neurocase Reference Number:

P638

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

ML

Key theoretical issue

- An Italian-speaking phonological dyslexic was able to read words from a familiar dialect (which she had never read before) better than non-words, although less well than Italian words. Facilitation of reading dialect words could come from retrieval of items in the phonological output lexicon, or from top-down mechanisms involving either the output lexicon or a potential store of graphemic forms generated by repeated auditory exposure to a word

Key words: Italian phonological dyslexia; dysgraphia

Scan, EEG and related measures

CT

Standardized assessment

WAIS, shortened Token Test, BDAE

Other assessment

Oral apraxia tasks, spontaneous speech, letter naming, letter sounding, syllable reading, reading aloud of numbers, word and non-word reading, matching spoken to written non-words, lexical decision, writing to dictation of single letters, syllables, words, and non-words, copying printed words from memory, writing numbers to dictation

Lesion location

- CT: Left fronto-parietal region including Broca's area, but sparing the posterior part of the temporal lobe

Lesion type

CVA

Language

English

Phonological dyslexia: loss of a reading-specific component of the cognitive architecture?

M. J. Farah, R. M. Stowe and K. L. Levinson

Abstract

This paper investigated the impact of a general phonological (PL) impairment on non-word reading in JD, a right-handed male (aged 62 years) with a history of progressive impairment of auditory language comprehension. In Experiment 1, word lists were administered to assess reading ability of irregular words and non-words. Results indicate that JD appears to be a typical PL dyslexic. In Experiment 2, a repetition task was designed in which the effects of semantic and auditory support for PL representation could be varied. JD and 10 control patients (aged 55–67 years) participated and repeated words and non-words. Results of Experiment 2 show that JD's apparent normacy at non-word repetition depends upon extra-PL sources of support, and that the less available these sources become, the more abnormal JD's repetition performance becomes. Possible causes of PL dyslexia, impaired aspects of PL representation, and literacy's affect on the alteration of brain architecture are discussed.

Journal

Cognitive Neuropsychology 1996; 13: 849–68

Neurocase Reference Number:

P639

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

JD

Key theoretical issue

- Non-reading-specific phonological impairment can account for cases of phonological dyslexia in which non-word repetition is apparently intact

Key words: phonological dyslexia; non-word repetition; dual-route model; triangle model

Scan, EEG and related measures

MRI

Standardized assessment

Boston Naming Test, Token Test, Western Aphasia Battery, Peabody Picture Vocabulary Test-Revised, Raven's Progressive Matrices, Rey Complex Figure, Porteus Mazes, WAIS-R

Other assessment

Reading of words and non-words, repetition of single words and non-words, repetition of strings of words and non-words

Lesion location

- Fronto-temporal, extreme on the left and minimal on the right

Lesion type

Atrophy due to (autopsy-confirmed) Pick's Disease

Language

English

On the underlying causes of semantic paralexias in a patient with deep dyslexia

R. B. Friedman and M. B. Perlman

Abstract

The nature of the underlying causes of paralexias produced by a patient exhibiting the syndrome of deep dyslexia was explored by pairing an oral reading task with a picture matching task using the same words. The results suggested two causes of semantic paralexias: word retrieval difficulties and impaired concept arousal. Parallel deficits in language tasks not involving written words were found. It is suggested that the major component of the deep dyslexia syndrome may reflect a deficit which is not specific to the written modality.

Journal

Neuropsychologia 1982; 20: 559–68

Neurocase Reference Number:

P640

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

FD

Key theoretical issue

- What is the underlying cause of semantic paralexia in deep dyslexia? Does it reflect general language disturbances?

Key words: semantic paralexia; deep dyslexia; semantic impairment

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination

Other assessment

Word and non-word reading, spoken and written word-picture matching

Lesion location

- Large left anterior lesion in the middle cerebral artery distribution with sparing of the frontal pole. The lesion extended from the middle frontal gyrus posteriorly to subcortical temporal lobe with questionable, or patchy, involvement of Wernicke's area. There was involvement of the anterior and superior portions of the parietal lobe

Lesion type

CVA

Language

English

Recovery from deep alexia to phonological alexia: points on a continuum

R. B. Friedman

Abstract

Reports of five patients, whose deep alexic reading all evolved into phonological alexia in a similar fashion, point to the hypothesis that deep alexia and phonological alexia represent different points on the same continuum. This hypothesis is explored further through an examination of previously published case reports of eleven patients with phonological alexia. Data from these patients suggest that there is a predictable succession of symptoms which form a continuum of severity of phonological alexia, with deep alexia as its endpoint. An account of the recovery from deep to phonological alexia, based upon a lexical (no-rules) model of reading, is provided (Glosser and Friedman, 1990, P644), and the implications for therapy are considered. The significance of the notion of a continuum of phonological/deep alexia is discussed.

Journal

Brain and Language 1996a; 52: 114–28

Neurocase Reference Number:

P641

Primary diagnosis of interest

Deep dyslexia, phonological dyslexia

Author's designation of case

1. EG
2. GR (see Neurocase Reference Number: P644)
3. DV (see Neurocase Reference Number: P644)
4. Leonardo (see Neurocase Reference Number: P680)
5. RL (see Neurocase Reference Number: P652)
6. RG (see Neurocase Reference Number: P110)
7. AM (see Neurocase Reference Number: P119)
8. GRN (see Neurocase Reference Number: P122)
9. BTT (see Neurocase Reference Number: P122)
10. LB (see Neurocase Reference Number: P113)
11. WB (see Neurocase Reference Number: P117)
12. MV
13. HR (see Neurocase Reference Number: P116)
14. Beatr (G. Sartori, unpublished)
15. Lucre (G. Sartori, unpublished)
16. Nicco (G. Sartori, unpublished)

Key theoretical issue

- Evaluation of published cases demonstrated (1) that the reading of five patients with deep dyslexia evolved, with recovery, into phonological, and (2) that the dyslexic symptoms in 11 further patients with phonological dyslexia appear in a predictable sequence. Thus, phonological dyslexia represents a continuum of severity, of which deep dyslexia is the endpoint

Key words: phonological dyslexia; deep dyslexia

Scan, EEG and related measures

None mentioned

Standardized assessment

None mentioned

Other assessment

Reading words and non-words

Lesion location

- 1. Left side
- 2. Not mentioned
- 3. Left common carotid artery
- 4. Right side
- 5. Not mentioned
- 6. Left parietal-occipital-temporal, deep

- 7. Right frontal, right temporal parietal
- 8. Not mentioned
- 9. Left PCA aneurysm
- 10. Right, MCA large
- 11. Left, large
- 12. Left subcortical posterior
- 13. Left temporal-parietal
- 14. Left anterior
- 15. Left anterior
- 16. Left anterior

Lesion type

1. MCA infarct subsequent to a cardiac embolus
2. Closed head injury
3. Laceration
4. CVA
5. Accident
6. Not mentioned
7. Not mentioned
8. Closed head injury
9. Aneurysm
10. MCA
11. Not mentioned
12. Not mentioned
13. Not mentioned
14. Not mentioned
15. Not mentioned
16. Not mentioned

Language

English

Modality-specific phonological alexia

R. B. Friedman, M. Beeman, S. N. Lott,
K. Link *et al.*

Abstract

Following a stroke, patient TL presented with a pure alexia that also displayed the features of phonological alexia (poor pseudo-word reading, part-of-speech effect). This pattern was absent, however, when words were spelled aloud to TL. The authors propose that, with visual input, orthographic word forms are only weakly activated in TL. This weak activation succeeds in activating strongly represented semantic codes — such as concrete nouns — but not weakly represented semantic codes — such as functor words — resulting in a part-of-speech effect. When words are spelled aloud, the input is sufficient to activate the orthographic word form strongly, and all words are identified. Most pure alexia patients can spell written words aloud to themselves (hence they are often called letter-by-letter readers), and consequently do not show symptoms of semantic reading. TL, whose letter-naming abilities are poor, cannot resort to this alternative strategy, and so the consequences of a weakly activated orthographic word form are revealed.

Journal

Cognitive Neuropsychology 1993; 10: 549–68

Neurocase Reference Number:

P642

Primary diagnosis of interest

Pure alexia with phonological alexia

Author's designation of case

TL

Key theoretical issue

- Characteristics of phonological dyslexia can occur in the presence of pure alexia

Key words: phonological alexia; pure alexia

Scan, EEG and related measures

CT

Standardized assessment

Boston Naming Test. Boston Diagnostic Aphasia Examination. Peabody Picture Vocabulary Test

Other assessment

Tactile naming and naming to description. Letter naming and matching. Word and non-word reading and writing to dictation. Identification of orally spelt words and non-words. Visual lexical decision. Written rhyme judgements. Word–picture matching. Written synonym triads and categorization

Lesion location

- CT (on admission) — large left temporal-parietal haematoma with compression of the adjacent lateral ventricle
- CT (3 months post-onset) — resolution of the haematoma, with residual involvement of the left posterior temporal and lateral occipital lobes

Lesion type

Haematoma

Language

English

Phonological text alexia: poor pseudo-word reading plus difficulty reading functors and affixes in text

R. B. Friedman

Abstract

Examined phonological alexia in two patients: (1) MS (aged 75 years), with errors on oral sentence reading and significant impairment in reading comprehension of sentences and paragraphs; and (2) BR (aged 62 years), with mild conduction aphasia with some anomia, considerable difficulty repeating both high and low probability phrases, a mild comprehension deficit, and reading and writing impairment. On single word reading tasks the patients read most words correctly and did not have particular difficulty reading functors compared with nouns and adjectives. However, their reading of text was markedly impaired, and errors occurred predominantly on functors and affixed words. Results show that patients' difficulty reading pseudo-words result from an inability to hold multiple phonological codes in memory. The author proposes that this may be the result of insufficient activation of phonological representations, excessive retroactive and proactive phonological interference, or both.

Journal

Cognitive Neuropsychology 1996b; 13: 869–85

Neurocase Reference Number:

P643

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

1. MS
2. BR

Key theoretical issue

- Two phonological dyslexic patients with reasonable single-word reading skills were shown to have particular difficulty with reading functors and affixes in text. The non-word reading impairment and the difficulties with text seemed to arise from trouble maintaining multiple phonological codes in memory, a phonological processing deficit which is not specific to reading

Key words: phonological dyslexia; reading text; phonological impairment

Scan, EEG and related measures

1. MRI
2. None reported

Standardized assessment

BDAE, Reading Comprehension Battery for Aphasia, Gates–McGinitie Speed and Accuracy Reading Test

Other assessment

Letter naming, reading of words and non-words, writing words and non-words to dictation, text reading, reading 'scrambled' paragraphs, non-word repetition, matching of spoken non-words, spoken-to-written non-word matching, digit span, word span, reading sentences presented with a rapid serial visual presentation technique

Lesion location

- 1. MRI: Left fronto-temporal lobe and periventricular white matter
- 2. Left temporoparietal

Lesion type

1. Not specified
2. Infarct

Language

English

The continuum of deep/phonological alexia

G. Glosser and R. B. Friedman

Abstract

Two patients exhibited all the characteristics of deep alexia shortly following brain injury. Both subsequently recovered some reading abilities and evolved to show a pattern of oral reading consistent with phonological alexia. These findings suggest that deep alexia and phonological alexia share common underlying deficits that are mediated by common neurological systems. A two-deficit psycholinguistic model is presented to account for the apparent continuity between deep alexia and phonological alexia.

Journal

Cortex 1990; 26: 343–59

Neurocase Reference Number:

P644

Primary diagnosis of interest

Deep dyslexia, phonological dyslexia

Author's designation of case

1. GR
2. DV

Key theoretical issue

- Two deep dyslexic patients who recovered some of their reading abilities evolved into phonological dyslexics. The apparent clinical continuity between the disorders suggests that deep dyslexia and phonological dyslexia are related on a continuum of shared, but relative, deficits in the phonological and semantic reading routes

Key words: deep dyslexia; phonological dyslexia; dual-route model; right hemisphere hypothesis

Scan, EEG and related measures

CT

Standardized assessment

1. BDAE, WAIS-R, WMS, Token Test, Clinical Evaluation of Language Functions, Boston Naming Test, Peabody Picture Vocabulary Test, Reading Comprehension Battery for Aphasia, Wide Range Achievement Test, Woodcock Reading Mastery Test, Gates–MacGinitie Reading Tests, Gray Oral Reading Test
2. BDAE, WAIS-R, WMS, Peabody Picture Vocabulary Test, Northwest Syntax Screening Battery, Boston Naming Test, Reading Comprehension Battery for Aphasia

Other assessment

1. Spontaneous speech, Saffran's test of comprehension of functors, reading words
2. Spontaneous speech, reading words and non-words

Lesion location

- 1. CT after injury: Depressed fracture to the right frontal bone with extension through the orbital roof and posterior portion of the left orbital roof. A small haematoma was seen in association with the right frontal bone fracture, and there was an area of contusion in the left temporal region with considerable mass effect in the left lateral ventricle
- 2. CT 3 weeks post-injury: Residual low density in the left inferior-middle temporal gyrus, and a resolving cephalohaematoma in the right frontal lobe with residual low density
- 3. CT: Large patchy infarct in the entire territory of the left middle cerebral artery, sparing all subcortical structures

Lesion type

1. Closed head injury
2. Infarction following surgery for lacerated carotid artery

Language

English

Category and modality specific dissociations in word comprehension and concurrent phonological dyslexia

H. Goodglass and C. Budin

Abstract

A 62-year-old aphasic patient was found to have a marked auditory comprehension deficit for body parts, colours, numbers and letters in the face of excellent comprehension for all other words categories and virtually intact reading comprehension for all word categories, including those affected by the auditory dissociation. A severe impairment in the graphophonemic route for reading was also discovered. The case is discussed in the context of category-specific dissociations after brain injury and the possible mechanisms of body part comprehension.

Journal

Neuropsychologia 1988; 26: 67–78

Neurocase Reference Number:

P645

Primary diagnosis of interest

Category specific auditory comprehension deficit

Author's designation of case

AA

Key theoretical issue

- The possibility that conceptual knowledge is organized by both category and modality

Key words: modality specific; category specific; word deafness; phonological dyslexia

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination

Other assessment

Spoken/written word to body/figure matching, and word to colour matching. Spoken-to-written word matching of functors, non-words, and words. Preposition to picture matching. Written homophony judgement

Lesion location

- A large lesion centred in the middle to posterior portion of the first and second temporal gyri. The lesion extended superiorly to involve motor and sensory cortices and supramarginal and angular gyri, and anteriorly into anterior cerebral artery territory, involving mesial motor cortex and supplementary motor areas. Its subcortical extent involved a portion of the posterior limb of the internal capsule and insular structures

Lesion type

CVA

Language

English

Subcortical aphasia with deep dyslexia: a case study of a Japanese patient

M. M. Hayashi, H. K. Ulatowska and S. Sasanuma

Abstract

The reading performance of a Japanese Broca-type aphasic patient on a single-word reading test was investigated. The result indicated that the subject fits the symptom complex of deep dyslexia in more than one aspect. Unique characteristics of this subject included (1) the isolated subcortical site of the lesion, which apparently produced deep dyslexia, and (2) double dissociations between kanji and kana processing and between oral reading and reading comprehension. The performance of this subject was compared with that of another Japanese deep dyslexic subject in S. Sasanuma [1980, In Coltheart M, Patterson K, Marshall JC (editors), *Deep dyslexia*, London: Routledge & Kegan Paul]. A theoretical implication was attempted based on a dual coding process scheme by Sasanuma and Fujimura (*Cortex* 1978; 7: 1–18).

Journal

Brain and Language 1985; 25: 293–313

Neurocase Reference Number:

P646

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

TO

Key theoretical issue

- Investigation of deep dyslexia in a Japanese speaker following a subcortical lesion

Key words: deep dyslexia; Japanese speaker; subcortical aphasia; kanji; kana

Scan, EEG and related measures

CT

Standardized assessment

Standard Language Test of Aphasia

Other assessment

Kanji, kana words, short sentence and number reading, and writing to dictation. Word and short sentence repetition. Kanji/kana to picture matching. Kanji-kanji semantic matching. Visual lexical decision

Lesion location

- Haemorrhage in the area of the left putamen, but thalamic nuclei and the caudate nucleus appeared to be spared. The lesion also involved the anterior limb of the internal capsule and extended inferoposteriorly to the superior temporal lobe and superiorly toward the angular gyrus subcortically. The centrum semiovale was also involved

Lesion type

Haemorrhage

Language

English

Implicit sublexical phonological processing in an acquired dyslexic patient

N. Hildebrandt and S. M. Sokol

Abstract

The authors report a case study of an acquired dyslexic subject, who on tasks standardly used to assess acquired dyslexia showed no evidence of having any access to sublexical phonological information. However, on a lexical decision task, he showed normal effects of spelling regularity for low frequency words. Since this effect is typically attributed to the use of sublexical phonological information in word recognition, it appears that sublexical phonological processing is occurring for this subject. The spelling regularity effect is discussed with respect to models of written word recognition and to acquired dyslexia. It is suggested that the reason for the discrepancy in test results may be that the types of explicit tasks previously used in the neuropsychological literature on dyslexia, which require conscious awareness of phonological representations, are not sensitive to implicit processing.

Journal

Reading and Writing 1993; 5: 43–68

Neurocase Reference Number:

P647

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

GR

Key theoretical issue

- Implicit, sublexical activation of phonology from print in deep dyslexia

Key words: implicit processing; spelling-to-sound regularity; deep dyslexia

Scan, EEG and related measures

CT, angiogram

Standardized assessment

Boston Naming Test

Other assessment

Word and non-word repetition. Sentence completion. Grammatical judgements. Word and non-word reading and spelling. Letter naming and segmentation. Phoneme blending and deletion. Lexical decision

Lesion location

- Left anterior temporal lobe extending into the left putamen and left corona radiata and left posterior temporal lobe. A large hypodense left frontoparietal extracerebral fluid collection is noted with slight effacement of the adjacent sulci

Lesion type

Haemorrhage

Language

English

Recognition reading in paralexia

N. Kapur and N. T. Perl

Abstract

Reading aloud and recognition reading were examined in a paralexia patient. Certainty ratings made by the patient during oral reading indicated that he was usually unaware of paralexia errors which he made. In an auditory recognition reading task for words previously misread, the patient still performed poorly, often choosing his paralexia response as the correct alternative. Possible mechanisms underlying paralexia are discussed in the light of these findings.

Journal

Cortex 1978; 14: 439–43

Neurocase Reference Number:

P648

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

PD

Key theoretical issue

- Ability of a deep dyslexic patient to monitor own reading responses

Key words: deep dyslexia; response monitoring

Scan, EEG and related measures

Angiogram

Standardized assessment

Not mentioned

Other assessment

Word reading

Lesion location

- Not mentioned

Lesion type

Complete occlusion of the left cerebral artery

Language

English

Activation of the phonological lexicon for reading and object naming in deep dyslexia

R. B. Katz and S. M. Lanzoni

Abstract

Poor oral reading in some cases of deep dyslexia could be due to difficulty in inhibiting the phonological lexical entries of words semantically related to the correct reading responses. If this is the case, then additional activation of the correct phonological entries should improve reading performance, whereas additional activation of competing entries should lead to errors. This should hold true for object naming as well as for reading, since both depend on a semantically mediated lexical route. These predictions were borne out with an 'output' deep dyslexic patient, who made many semantic errors in both reading and naming. Providing phonetic cues (the initial portions of the correct responses) increased his reading and naming accuracy, and providing miscues (the initial portions of words related semantically to the correct responses) led to errors. Furthermore, when the patient was shown a printed word or pictured object and the examiner spoke a correct reading or naming response in isolation, the patient almost always accepted the response as correct, but he also judged that many semantically related foils were correct. Finally, a comparison of reading and naming errors suggested that 'visual' errors may sometimes have a phonological basis.

Journal

Brain and Language 1997; 58: 46–60

Neurocase Reference Number:

P649

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

JA

Key theoretical issue

- Semantic errors in the reading of deep dyslexics may arise from competition among phonological representations in the phonological lexicon

Key words: output deep dyslexia; anomia; semantic errors; cueing

Scan, EEG and related measures

CT

Standardized assessment

BDAE, Peabody Picture Vocabulary Test, Boston Naming Test

Other assessment

Semantic matching of spoken and written words, matching spoken words to written words and pictures, reading of picture names, reading and naming with phonetic cues and miscues, recognizing correct and incorrect responses on reading and naming

Lesion location

- CT: large lesion in the left fronto-temporal-parietal area, involving a portion of Broca's area with deep extension into the subcallosal fasciculus. The posterior portion of the lesion involved the superior temporal gyrus, and there was involvement of anterior periventricular white matter. The lesion also affected the insular structures, putamen, and the anterior limb of the internal capsule

Lesion type

Not mentioned

Language

English

Automatic activation of word phonology from print in deep dyslexia

R. B. Katz and S. M. Lanzoni

Abstract

The performance of deep dyslexics in oral reading and other tasks suggests that they are poor at activating the phonology of words and non-words from printed stimuli. As the tasks ordinarily used to test deep dyslexics require controlled processing, it is possible that the phonology of printed words can be better activated on an automatic basis. This study investigated this possibility by testing a deep dyslexic patient on a lexical decision task with pairs of stimuli presented simultaneously. In Experiment 1, the deep dyslexic, like normal patients, showed faster reaction times (RTs) on trials with rhyming, similarly spelled stimuli (e.g., bribe-tribe) than on control trials (consisting of non-rhyming, dissimilarly spelled words), but slower RTs on trials with non-rhyming, similarly spelled stimuli (e.g., couch-touch). When the experiment was repeated using function words as stimuli, the patient no longer showed a phonological effect. Therefore, the phonological activation of printed content words by deep dyslexics may be better than expected on the basis of their oral reading performance.

Journal

Quarterly Journal of Experimental Psychology 1992; 45A: 575-608

Neurocase Reference Number:

P650

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

JA

Key theoretical issue

- Is there phonological activation of printed words and non-words in deep dyslexia?

Key words: phonological activation; deep dyslexia; priming

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination, WAIS-R, Wechsler Memory Scale, Boston Naming Test, Peabody Picture Vocabulary Test

Other assessment

Oral spelling and spelling to dictation. Written picture naming. Reading aloud of words, sentences, numbers, non-words and pseudo-suffixed words. Spoken-written non-word and word matching. Written synonym judgement

Lesion location

- CT (3 months post-onset) — large lesion in the left fronto-temporo-parietal area involving a portion of Broca's area with deep extension involving the subcallosal fasciculus. The posterior portion of the lesion involved the anterior superior temporal gyrus, the anterior half of the temporal isthmus, and approximately half of Wernicke's area. Superior lesion extension affected motor and sensory cortex and the anterior supramarginal gyrus, and there was involvement of the anterior periventricular white matter. Furthermore, the lesion affected the insular structures, putamen, and the anterior limb of the internal capsule
- CT (7 years post-onset) — larger lesion with more posterior extension into the temporal and parietal lobes and greater involvement of Wernicke's area, the temporal isthmus, and the supramarginal gyrus

Lesion type

CVA

Language

English

Rule-based treatment for acquired phonological dyslexia

D. L. Kendall, M. R. McNeil and S. L. Small

Abstract

In the context of a multiple-baseline design, this study demonstrated the positive effects of behavioural treatment using grapheme to phoneme correspondence rules to treat a female patient (aged 42 years) with phonological dyslexia 17 years after stroke onset. Treatment used repeated exposure to real and nonsense word stimuli embodying the regularities of two grapheme to phoneme correspondence rules (GPCR) with hierarchical cueing and knowledge of results. Results revealed a pattern of performance that increased beyond baseline variability and coincided in time with the institution of treatment. Generalization of these treatment effects occurred to words requiring knowledge of other GPCR and to an independent processing based reading measure.

Journal

Aphasiology 1998; 12: 587-600

Neurocase Reference Number:

P651

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

WT

Key theoretical issue

- Description and evaluation of a behavioural therapy for phonological dyslexia

Key words: phonological dyslexia; therapy; grapheme to phoneme correspondence rules

Scan, EEG and related measures

MRI

Standardized assessment

Revised Token test, Discourse Production Test, Apraxia Battery for Adults, Gates-MacGinitie Reading Test, Western Aphasia Battery, Pyramid and Palm Trees Test, Boston Naming Test, Reading Comprehension Battery for Aphasia, WAIS-R

Other assessment

Reading of paragraphs, non-words, repetition of non-words, written rhyme judgements

Lesion location

- Infarct in the left middle cerebral artery distribution with involvement of the left fronto-temporal cortex and left basal ganglia

Lesion type

Ischaemic stroke following lightning strike

Language

English

The evolution of deep dyslexia: evidence for the spontaneous recovery of the semantic reading route

D. Klein, M. Behrmann and E. Doctor

Abstract

Most theoretical accounts of deep dyslexia postulate at least two independent deficits which give rise to the observed pattern of reading impairment. One deficit is an inability to derive phonology from orthography sublexically and the second is an impairment in semantically mediated reading. These deficits generate a host of symptoms including an impairment in reading non-words, a part-of-speech effect and imageability effect in word reading, and, importantly, the occurrence of semantic paralexias. It is possible, then, that during recovery of deep dyslexia, either one or both of these underlying deficits resolve. The authors describe a case, RL, with deep dyslexia who showed significant change in his reading performance in the absence of any therapeutic intervention. At 18 months post-onset, unlike at 6 months post-onset, RL no longer produced any purely semantic errors nor did he show effects of imageability or part-of-speech on his oral reading. Despite this change, RL's ability to read non-words did not improve significantly over this time period. These findings suggest that selective and spontaneous recovery of the semantic reading route can occur independent of significant change in the sublexical reading route.

Journal

Cognitive Neuropsychology 1994; 11: 579–611

Neurocase Reference Number:

P652

Primary diagnosis of interest

Deep and phonological dyslexia

Author's designation of case

RL

Key theoretical issue

- What is the underlying functional change associated with partial recovery from deep to phonological dyslexia?

Key words: deep dyslexia; phonological dyslexia; semantically mediated reading; sublexical reading

Scan, EEG and related measures

Not mentioned

Standardized assessment

National Adult Reading Test

Other assessment

Visual lexical decision, spoken and written synonym judgement, and semantic triad decision, non-word and word reading

Lesion location

- Left frontoparietal haemorrhagic contusion

Lesion type

Head injury

Language

English

Semantic errors in a deep dyslexic

M. Laine, P. Niemi, J. Niemi and
P. Koivuselkae-Sallinen

Abstract

Reports a case of a 38-year-old Swedish-speaking deep dyslexic man whose semantic paralexias appeared to result mainly from a lexical retrieval failure in oral reading. The subject was able to draw correct pictures of the written words for which a semantically erroneous oral reading response was simultaneously produced. Repeated attempts to correct paralexemic responses were common, indicating that the subject was often aware of the errors. Lexical retrieval problems and semantic errors extended to naming as well. Results support K. A. Nolan and A. Caramazza's (1982; P661) dual-deficit model of deep dyslexia.

Journal

Brain and Language 1990; 38: 207–14

Neurocase Reference Number:

P653

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

VJ

Key theoretical issue

- A deep dyslexic patient was able to draw correct pictures of written words for which he made semantic errors in reading. The semantic errors seemed to result from a deficit in retrieving the correct phonological output forms of words

Key words: output deep dyslexia; anomia; semantic errors; lexical deficit

Scan, EEG and related measures

CT, EEG, carotid angiography

Standardized assessment

BDAE, Boston Naming Test

Other assessment

Picture naming, object naming, letter naming, repetition of words and non-words singly and in strings, writing own name and address, word reading, picture drawing

Lesion location

- CT: Large left medial cerebral artery infarction affecting the perisylvian language areas. The damage extended from Broca's area to the insula, the auditory areas, and the supramarginal and angular gyri. The lesion also extended deep into the underlying white matter but the basal ganglia were intact. No damage to the right hemisphere was observed

Lesion type

Infarction

Language

English

The representation of sublexical orthographic-phonologic correspondences: evidence from phonological dyslexia

M. F. Lesch and R. C. Martin

Abstract

Although there is considerable evidence that grapheme and body units are involved in assembling phonology from print, there is little evidence supporting the involvement of syllabic representations. The authors provide evidence on this point from a phonological dyslexic patient (ML) who, as a result of brain damage, is relatively unable to read non-words. ML was found to be able to perform tasks assumed to reflect processes involved in assembled phonology (i.e. segmentation, orthographic-phonologic conversion, and blending) when the units involved were syllables, but demonstrated considerable difficulty when they were onset, body, or phoneme units. Additionally, both ML and matched controls were much better able to find words in an anagrams task (Treiman and Chafetz, Attention and performance XII. Hove, UK: Lawrence Erlbaum Associates, 1987) when they resulted from the combination of segments corresponding to syllables than when they did not. It is suggested that the relationship between print and sound is represented at multiple levels (including the syllable) (Shallice *et al.*, Quarterly Journal of Experimental Psychology 1983; 35(A): 111-38) and that ML's non-word reading impairment is the result of disruption of representations below the level of the syllable.

Journal

Quarterly Journal of Experimental Psychology 1998; 51(A): 905-38

Neurocase Reference Number:

P654

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

ML

Key theoretical issue

- The non-word reading deficit in the patient reported here was not due to a disruption of the processes subserving sublexical phonology *per se*, but arose from a disruption of orthographic and phonological representations at levels below the syllable (i.e., onset, body, and phoneme)

Key words: phonological dyslexia; phonological representations; orthographic representations

Scan, EEG and related measures

CT

Standardized assessment

PALPA, Philadelphia Comprehension Battery

Other assessment

Word and non-word reading, indicating syllable breaks, onset-body units, and graphemes/phonemes in written and spoken words, reading syllables and onset-body units, naming letters, production of letter name to match letter sound, letter sounding, spoken-to-written word matching, non-word repetition, blending of orally presented syllables, onset-body units and phonemes, blending of visually presented orthographic/phonological units

Lesion location

- CT: Infarction involving left frontal and parietal operculum, atrophy in the left temporal operculum, mild diffuse atrophy

Lesion type

Infarction, atrophy

Language

English

Storage or parsing of morphologically complex words? A case study in agrammatism

C. Luzzatti, S. Mondini and C. Semenza

Abstract

The performance of a 24-year-old male patient affected by agrammatism and phonological dyslexia from Broca's aphasia was analysed. The patient was tested with a series of tasks requiring lexical retrieval of simple and morphologically complex words. The patient presented a pattern of errors that is interpreted as the result of the prominent use of the lexical routine. This pattern of errors was characterized by frequency effect more than by a difference between types of suffixes (inflectional vs. derivational) or types of word. It seems that high-frequency morphologically complex items will meet stored representations, thus avoiding more costly parsing that is required for less frequent items. These results are in keeping with dual-route models of lexical representation of morphologically complex words.

Journal

Brain and Cognition 1999; 40: 183-5

Neurocase Reference Number:

P655

Primary diagnosis of interest

Agrammatism and phonological dyslexia

Author's designation of case

MB

Key theoretical issue

- Investigation of the way in which morphologically complex words are processed by studying a patient within impaired non-lexical reading (phonological dyslexic)

Key words: morphological complexity; phonological dyslexia; agrammatism

Scan, EEG and related measures

Not mentioned

Standardized assessment

Not mentioned

Other assessment

Lexical decision, reading aloud and repetition of words, non-words and pseudo-suffixed words

Lesion location

- Left fronto-insular lesion

Lesion type

Vascular

Language

English

Patterns of paralexia: a psycholinguistic approach

J. C. Marshall and F. Newcombe

Abstract

A sample of the literature on acquired dyslexia was reviewed with special reference to the nature of paralexia errors. Linguistic studies of six cases of dyslexia are presented with appropriate neurological and psychological details: there are two cases of each of three hypothesized types of impairment, visual dyslexia, surface dyslexia, and deep dyslexia. Finally a scheme for acquired dyslexia is proposed and related to the error patterns observed in 'normal' adult readers and in children learning to read; our approach to lexical look-up is one that the diagram makers may have found sympathetic.

Journal

Journal of Psycholinguistic Research 1973; 1: 175–99

Neurocase Reference Number:

P656

Primary diagnosis of interest

Deep dyslexia, visual dyslexia and surface dyslexia

Author's designation of case

GR (see also P675 — Richardson, 1975)

KU

Key theoretical issue

- Classification of acquired dyslexia and relationship to the architecture underlying normal reading

Key words: deep dyslexia; visual dyslexia; surface dyslexia; semantic paralexia

Scan, EEG and related measures

Not mentioned

Standardized assessment

Not mentioned

Other assessment

Digit span, word recall, object naming, Reading, writing and oral spelling of words

Lesion location

- GR — left temporo-parietal region
- KU — left temporo-occipital

Lesion type

GR — missile wound
KU — gunshot wound

Language

English

Serial processing and the 'phonetic route': lessons learned in the functional reorganization of deep dyslexia

C. Matthews

Abstract

Describes a 37-year-old man with chronic agrammatic Broca's aphasia who presented with symptoms of deep dyslexia, in which it is presumed that phonologic processing of the written message is disrupted. Functional reorganization of the non-lexical or phonetic route of reading was undertaken whereby the patient must learn consciously to control behaviors that had formerly been unconscious and automatic. The patient's responses in treatment made it clear that the phonetic route encompasses at least two dissociable functions: grapheme–phoneme conversion and sequential analysis. This is discussed in light of A. R. Luria's (Traumatic aphasia. The Hague: Mouton and Co., 1970; Higher cortical functions in man. New York: Basic Books, 1980) ideas regarding the functions of the pre-central and post-central regions of sensorimotor cortex.

Journal

Journal of Communication Disorders 1991; 24: 21–39

Neurocase Reference Number:

P657

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

HM

Key theoretical issue

- Re-training of grapheme–phoneme conversion skills in a deep dyslexic was not sufficient to enable accurate sounding-out of written words. Additional training in sequencing was required to get the patient to move from left to right when sounding out words or sentences

Key words: deep dyslexia; therapy

Scan, EEG and related measures

None mentioned

Standardized assessment

BDAE

Other assessment

None mentioned

Lesion location

- Not mentioned

Lesion type

Stroke

Language

English

Two different readers in the same brain after a posterior callosal lesion

F. Michel, M. A. Henaff and J. Intriligator

Abstract

Two different types of reading, one in each hemifield, were exhibited by a patient with a lesion of the posterior half of the corpus callosum. The patient read normally when words and non-words were presented to his right visual field. However, with left visual field presentations, the patient could not read non-words and vocalized real words very slowly, especially abstract words, inflected verbs and function words. He often replaced concrete words by semantic associates. Such an abnormal reading pattern is similar to that known as deep dyslexia. This unilateral deficit reveals the competence of the right hemisphere to initiate some semantic processing and its inability to manage phonological coding. The hypothesis that deep dyslexia is due to right hemisphere reading is reinforced by the present case.

Journal

NeuroReport 1996; 7: 786–8

Neurocase Reference Number:

P658

Primary diagnosis of interest

Posterior callosal split, deep dyslexia

Author's designation of case

AC

Key theoretical issue

- The patient showed normal reading when words were presented in his right visual field, but showed features of deep dyslexic reading when words were presented in his left visual field (i.e., to his right hemisphere). This supports the hypothesis that deep dyslexia is due to right hemisphere reading

Key words: deep dyslexia; right hemisphere hypothesis; split-brain patient

Scan, EEG and related measures

MRI

Standardized assessment

Not mentioned

Other assessment

All tasks involved presenting written stimuli to left or right visual fields: reading of words non-words, and sentences, semantic category decision, synonym judgements, rhyme judgements

Lesion location

- Haemorrhage in the left mesial parietal lobe
- MRI after surgery: porencephalic cyst in the left parietal lobe and a posterior callosal split

Lesion type

Haemorrhage (due to AVM), followed by surgery

Language

English

Concreteness effects in word production but not word comprehension in deep dyslexia

P. K. Newton and C. Barry

Abstract

The authors present a patient, LW, who, like all deep dyslexics, is more able to read aloud concrete than abstract words. In order to explore the cause of this concreteness effect in word production, the authors tested LW's comprehension of concrete and abstract words, in the Shallice and McGill word–picture matching task, in a synonym judgement task, and in a definition-to-word matching task. LW showed no significant impairment of her comprehension of abstract high-frequency words in these tasks, despite being unable to read most of the words aloud. The authors conclude that the concreteness effect in oral reading in LW cannot be due solely to a semantic deficit for abstract words. The authors propose the NICE model, in which concreteness is an important dimension of normal lexicalization, and suggest that deep dyslexia reflects the ability of qualitatively normal but isolated semantics to access or 'drive' unique entries in a phonological output lexicon (subject to a pathological increased aphasic 'threshold' for lexicalization).

Journal

Cognitive Neuropsychology 1997; 14: 481–509

Neurocase Reference Number:

P659

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

LW

Key theoretical issue

- The nature of the concreteness effect on reading accuracy in deep dyslexia

Key words: concreteness; deep dyslexia; comprehension

Scan, EEG and related measures

Not mentioned

Standardized assessment

Not mentioned

Other assessment

Word and non-word reading and repetition. Rhyme judgement. Writing to dictation. Picture naming. Lexical decision. Synonym matching. Definition-to-written word matching

Lesion location

- Not mentioned

Lesion type

Subarachnoid haemorrhage, aseptic meningitis, clipped aneurysm at the junction of the internal carotid and middle cerebral arteries

Language

English

The autocue? Self-generated phonemic cues in the treatment of a disorder of reading and naming

L. Nickels

Abstract

This study describes a therapy programme that aimed to improve oral reading and spoken naming in a deep dyslexic patient by teaching the patient grapheme-phoneme correspondences. This aim was achieved and the improvement could be attributed to the specific effects of the therapy. However, the pattern of results obtained was very different to that predicted. The patient proved unable to perform or to relearn one of the processes necessary for successful reading by a sublexical routine (blending of individual phonemes to form a word). It is concluded that the improvement had been achieved not by a learned mechanism for sublexical reading but instead by enabling the use of patient-generated phonemic cues. The therapy had enabled the patient to produce successfully the phoneme associated with the initial letter of the word, which then acted as a phonemic cue facilitating reading of that word. Spoken naming was also facilitated as information on the written form of the word could similarly be used to provide a phonemic cue for spoken production.

Journal

Cognitive Neuropsychology 1992; 9: 155-82

Neurocase Reference Number:

P660

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

TC

Key theoretical issue

- Theoretical analysis of a successful therapy programme for a patient with deep dyslexia

Key words: deep dyslexia; phonemic cueing; therapy

Scan, EEG and related measures

CT, ECG

Standardized assessment

WAIS, Raven's Advanced Progressive Matrices, Peabody Picture Vocabulary Test, Boston Diagnostic Aphasia Examination, Pyramid and Palm Trees test

Other assessment

Cross-case matching. Non-word spoken minimal pair judgement. Visual and spoken lexical decision. Spoken and written word-picture matching, and synonym judgement. Reading, repeating and spelling to dictation word and non-words

Lesion location

- Very substantial left middle cerebral artery infarct

Lesion type

CVA

Language

English

Modality-independent impairments in word processing in a deep dyslexic patient

K. A. Nolan and A. Caramazza

Abstract

An extensive study of the language abilities of one deep dyslexic patient, BL, was undertaken. Tests of his ability to comprehend and produce words in the auditory, verbal, and graphic modalities revealed striking similarities in performance across modalities, such that the defining symptoms of deep dyslexic reading also held true for this patient's writing, repetition, and naming. A new dual-deficit model of deep dyslexia is presented which predicts that a variety of 'deep dyslexic' syndromes may occur with or without modality-specific impairments.

Journal

Brain and Language 1982; 16: 237-64

Neurocase Reference Number:

P661

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

BL

Key theoretical issue

- The contribution of modality-specific vs. modality-independent deficits in deep dyslexia

Key words: deep dyslexia; modality-specific impairment; modality-independent impairment

Scan, EEG and related measures

CT

Standardized assessment

Boston Diagnostic Aphasia Examination, Peabody Picture Vocabulary Test, visual and spoken lexical decision, word and non-word writing to dictation and delayed copying, Boston Naming Test

Other assessment

Word, non-word and pseudo-homophone reading, spoken-written syllable matching, word and non-word repetition, probed word span, picture naming

Lesion location

- Infarction on the left in a typical superficial and deep middle cerebral artery distribution: temporal lobe (particularly anterior pole), posterior frontal (either involving or undercutting Broca's area), parietal area extending nearly to the vertex, and the insula and basal ganglia. Corresponding dilatation of the anterior horn and body of the left lateral ventricle

Lesion type

CVA

Language

English

An analysis of writing in a case of deep dyslexia

K. A. Nolan and A. Caramazza

Abstract

In tests of her ability to produce written and spoken language, this deep dyslexic patient produced semantic, visual, and derivational errors, including functor substitutions, and exhibited part-of-speech and abstractness effects in oral reading, oral and written naming, and writing to dictation, but not in repetition of single words and copying from memory. This patient therefore provides confirmation of the hypothesis presented in Nolan and Caramazza (1982, P661) that the defining symptoms of deep dyslexia will be observed in responses to any task which requires lexical mediation. The patient's written responses in all tasks but direct copying were characterized by spelling errors which included transpositions, omissions, substitutions, and additions of letters. A model of writing is proposed which explains these errors in terms of a disruption of a phoneme-grapheme conversion process which normally functions to prevent decay of information from a graphemic buffer.

Journal

Brain and Language 1983; 20: 305-28

Neurocase Reference Number:

P662

Primary diagnosis of interest

Deep dyslexia, deep dysgraphia

Author's designation of case

VS

Key theoretical issue

- Impairments in naming and writing can co-occur with deep dyslexic reading

Key words: deep dyslexia; deep dysgraphia; graphemic buffer; models of reading; writing and naming

Scan, EEG and related measures

CT

Standardized assessment

Peabody Picture Vocabulary Test

Other assessment

Reading of words and non-words, auditory and visual lexical decision, matching of spoken words to pseudo-homophones, matching spoken to written syllables, repetition of words and non-words, written naming of objects and pictures, writing to dictation of words and non-words, copying printed words from memory

Lesion location

- CT: Left temporal lobe and left temporo-parietal region, with definite involvement of the left supramarginal gyrus and probably involvement of the left angular gyrus. There may be some involvement of the posterior portion of the inferior frontal gyrus, based on widening of the Sylvian fissure and dilation of the left frontal horn of the lateral ventricle

Lesion type

Infarction

Language

English

The continuum of deep/surface dyslexia

K. A. Nolan, B. T. Volpe and L. A. Burton

Abstract

A right-handed male sustained traumatic brain injury which resulted in anomia, dyslexia and agraphia. The most severe CT-identified brain damage was located in the right parieto-temporal lobe. In the first months following injury, the pattern of reading errors was similar to that associated with deep dyslexia. However, non-lexical derivation of phonology from print was not abolished. As the patient's ability to associate letter patterns with sounds improved, oral reading also improved. Although he no longer produced semantic errors in oral reading, he continued to produce oral reading errors that were visually and phonologically related to the targets. Four months after the injury, the error pattern observed in the patient's oral reading was consistent with very mild surface dyslexia. The significance of these observations to dual-deficit models of acquired dyslexia was discussed, as well as their implications for rehabilitation.

Journal

Journal of Psycholinguistic Research 1997; 26: 413-24

Neurocase Reference Number:

P663

Primary diagnosis of interest

Deep, phonological and surface dyslexia

Author's designation of case

DC

Key theoretical issue

- Pattern of partial recovery from deep dyslexia

Key words: deep dyslexia; phonological dyslexia; surface dyslexia

Scan, EEG and related measures

CT

Standardized assessment

WAIS-R, WMS-R, Wisconsin Card Sorting Test, Benton Test of Face Recognition, Raven's Coloured Progressive Matrices, Boston Naming Test, Western Aphasia Battery

Other assessment

Word and non-word reading, written spelling

Lesion location

- Right parieto-temporal lobe

Lesion type

Subdural haematoma and surgery following head injury

Language

English

Phonological dyslexia and phonological dysgraphia following left and right hemispherectomy

J. A. Ogden

Abstract

Four adults who had hemispherectomies because of severe epilepsy following infantile childhood damage to one hemisphere of the brain, are assessed on their reading and spelling abilities in an attempt to see if the two hemispheres are equipotential for these abilities in infancy. The psycholinguistic assessments of language processing in aphasia (PALPA) are used, and the results are interpreted from the viewpoint of hypotheses of 'normal' right and left hemisphere reading abilities. Overall, the results suggest that the two hemispheres are equipotential for developing the skills underlying reading, but the left hemisphere is more specialized for the skills underlying spelling. All participants could read learnt regular and irregular words, and abstract and concrete words, suggesting that the reading lexicon develops in line with a normal left hemisphere lexicon, whichever hemisphere remains intact following hemispherectomy. However, poor reading of non-words suggests that the phonological reading route is severely impaired following left hemispherectomy (phonological dyslexia), and somewhat impaired following right hemispherectomy. The right-hemispherectomized participant is only mildly impaired on spelling real words, in contrast to the left-hemispherectomized participants who are markedly impaired. None of the participants could spell non-words, suggesting that the phonological spelling route is impaired following removal of either hemisphere (phonological dysgraphia).

Journal

Neuropsychologia 1996; 34: 905–18

Neurocase Reference Number:

P664

Primary diagnosis of interest

Phonological dyslexia, phonological dysgraphia, hemispherectomy

Author's designation of case

1. KO'F
2. FS
3. RM
4. MJ

Key theoretical issue

- Investigation of hemispheric specialization via comparison of reading and spelling skills when mediated by solo hemispheres (in adults who underwent hemispherectomy in infancy or early childhood)

Key words: phonological dyslexia; phonological dysgraphia; equipotentiality; language specialization

Scan, EEG and related measures

1. CT, EEG, pneumonencephalogram
2. CT
3. CT, EEG, air encephalography
4. CT, air encephalography

Standardized assessment

WAIS-R, WMS-R, Short Token Test, Reporter's Test, Minnesota Test for Differential diagnosis of Aphasia, Active-Passive Test, PALPA Tests

Other assessment

None

Lesion location

- 1. Left hemisphere
- 2. Left hemisphere
- 3. Left hemisphere
- 4. Right hemisphere

Lesion type

Hemispherectomy

Language

English

Word specific impairments in naming and spelling but not reading

L. Orpwood and E. K. Warrington

Abstract

A patient, who had suffered a left-hemisphere CVA, is described. He had a major aphasic syndrome which encompassed both his propositional speech and literacy skills. However, his comprehension of both spoken and written language was intact. His superior ability to retrieve nouns as opposed to other word classes was systematically investigated. This superiority of noun processing was restricted to concrete nouns. It was found that he had a significant deficit in the naming of action pictures as compared with object pictures, and a significant deficit in the written spelling of verbs as compared with nouns when matched for concreteness. His single-word reading, for all word classes, was virtually intact. The theoretical significance of these findings is discussed. It is concluded that current information processing models, that postulate a unitary phonological output store, will require elaboration in order to account for these data. The authors tentatively suggest that there may be exclusive output stores for naming, reading and spelling.

Journal

Cortex 1995; 31: 239–65

Neurocase Reference Number:

P665

Primary diagnosis of interest

Verb-naming deficit, verb-spelling deficit, phonological dyslexia, phonological dysgraphia

Author's designation of case

MRF

Key theoretical issue

- There is some degree of separability in the output mechanisms for reading and naming

Key words: word class impairments; output lexicon; anomia; dyslexia; dysgraphia

Scan, EEG and related measures

EMI scan, CT

Standardized assessment

WAIS, WAIS-R, Peabody Picture Vocabulary Test, Token Test, Warrington Recognition Memory Test, British Picture Vocabulary Scale, Test for the Reception of Grammar, Schonell Graded Word Reading Test, Graded Difficulty Spelling Test, Boston Naming Test, Graded Naming Test, Oldfield Naming Test

Other assessment

Spontaneous speech, abstract and concrete word comprehension test, spoken word-picture matching, reading of words and non-words, graded non-word reading test, writing words and non-words to dictation, picture naming, naming to verbal description, written picture naming, production of verbal descriptions of written words

Lesion location

- EMI scan: left fronto-temporal-parietal region, in the distribution of the middle cerebral artery also involving the lentiform nucleus

Lesion type

Infarct

Language

English

Deep dyslexia in a Dutch-speaking patient

**P. Paquier, P. Van-Vugt, P. Bal,
H.-R. Van-Dongen *et al.***

Abstract

A left-handed, Dutch-speaking woman of average intelligence became aphasic after having sustained a left frontotemporal cerebrovascular accident. As she had made semantic paralexias while reading isolated words during a routine aphasiological assessment, the authors wanted to know whether she could be characterized as 'deep dyslexic', and whether the deep dyslexia symptom complex described in English-speaking patients would recur in a Dutch-speaking patient. The authors subsequently administered two experimental reading tests in order to investigate the organization of five situational lexical-semantic categories, and to analyse the types of reading errors affecting different word classes. Our findings, which indicate that the patient is a deep dyslexic reader, shed light upon three theoretical issues: (1) the occurrence of individual differences within the symptom complex, (2) the plurimodality of certain features first thought to be specific to reading, and (3) the underlying causes of the semantic paralexias.

Journal

Aphasiology 1992; 6: 309–20

Neurocase Reference Number:

P666

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

LG

Key theoretical issue

- Evaluation of deep dyslexia in a Dutch-speaking patient
- Individual differences in the symptoms of deep dyslexia

Key words: deep dyslexia; Dutch; symptom complex

Scan, EEG and related measures

CT, MRI

Standardized assessment

Raven's Standard Progressive Matrices

Other assessment

Reading, repetition and writing to dictation of words and non-words, written word-picture matching, associative matching test

Lesion location

- Frontotemporal hypodensity in the left hemisphere, lesions of the optic chiasm and of the right frontoparietal region (due to biopsy)
- MRI — low signal intensity triangular lesion in the left insular cortex, frontal operculum and anterior temporal lobe, and dilatation of the central sulci of the left parietal lobe. The encephalomalacia and compensatory dilatation of the nearby cerebrospinal fluid spaces indicate tissue loss secondary to a mature 2-year-old left middle cerebral artery infarct

Lesion type

- Tumour of the optic chiasm due to neurofibromatosis of von Recklinghausen, plus CVA

Language

English

Phonemic dyslexia: errors of meaning and the meaning of errors

K. E. Patterson

Abstract

Most paralexia errors made by phonemic dyslexic patients in reading single words aloud are classifiable as derivational, semantic, or visual errors. A study of two such patients' assessment of their own reading showed differences as a function of errors, with the patients generally identifying semantic paralexias as errors but classifying derivational and visual paralexias as correct readings. This pattern was confirmed in a test of the patients' ability to select one of three spoken words to match a printed word. The results are discussed in terms of a theoretical account of the processing of written words by normal readers and by phonemic dyslexics.

Journal

Quarterly Journal of Experimental Psychology 1978; 30: 587–601

Neurocase Reference Number:

P667

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

DE and PW [see Patterson, 1979 (P668) and Patterson and Marcel, 1977 (P669)]

Key theoretical issue

- Self monitoring of paralexias and the status of written comprehension in deep dyslexia

Key words: semantic paralexia; deep dyslexia

Scan, EEG and related measures

Not mentioned

Standardized assessment

Boston Diagnostic Aphasia Examination, Peabody Picture Vocabulary Test, Schonell graded word reading test

Other assessment

Word reading, patient rating of paralexia, spoken-written word and non-word matching

Lesion location

- Not mentioned

Lesion type

DE — head injury
PW — CVA

Language

English

What is right with 'deep' dyslexic patients?

K. E. Patterson

Abstract

Two aphasic adults with a specific acquired dyslexia were given tests requiring the processing of written words and sentences. Despite the general severity of the patients' deficits, some aspects of such processing appear to be relatively well preserved. The patients have particular difficulty reading aloud function words and abstract words; yet in word/non-word discrimination tests, both patients showed normal recognition of function words and one showed normal performance with abstract words. The patients do have a deficit in comprehension of visually presented words and sentences; yet their performance on comprehension tests was considerable and, moreover, showed meaningful relationships with their ability to read aloud.

Journal

Brain and Language 1979; 8: 111–29

Neurocase Reference Number:

P668

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

DE and PW [see Patterson, 1978 (P667) and Patterson and Marcel, 1977 (P669)]

Key theoretical issue

- Focuses upon the nature of (relatively) preserved abilities in deep dyslexia, in particular the patients' ability to comprehend

Key words: deep dyslexia; function words; abstract words; comprehension

Scan, EEG and related measures

CT

Standardized assessment

Peabody Picture Vocabulary Test

Other assessment

Visual lexical decision, written synonym judgement, semantic categorization, sentence comprehension, word recognition memory

Lesion location

- DE — left middle and posterior parts of the frontal lobe and essentially all of the left temporal lobe
- PW — posterior part of the left frontal lobe, all of the left temporal lobe, virtually all of the left parietal lobe and partial involvement of the left occipital lobe

Lesion type

DE — head injury
PW — CVA

Language

English

Aphasia, dyslexia and the phonological coding of written words

K. E. Patterson and A. J. Marcel

Abstract

A possible account of the reading difficulties of certain aphasic-dyslexic patients includes the notion that they are impaired in translating the written word into a phonological code via grapheme-phoneme conversion rules. This notion was tested in two experiments, both utilizing orthographically regular non-words (like *dake*) as stimuli. The first experiment provides an analysis of two patients' (largely successful) attempts to read non-words, and their (almost totally unsuccessful) attempts to read them. Second, in a lexical decision task, the finding that normal subjects are slowed by non-words homophonic with real words (like *flore*) was replicated using a modified technique. This effect, attributable to phonological coding, was not shown by the patients. At the same time, their ability to discriminate between words and non-words was essentially intact. Consideration was given to mechanisms which might underlie such patients' correct and erroneous readings of words and non-words.

Journal

Quarterly Journal of Experimental Psychology 1977; 29: 307–18

Neurocase Reference Number:

P669

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

DE, PW [see Patterson, 1978, 1979 (P667, P668)]

Key theoretical issue

- The degree of phonological activation from print in deep dyslexia

Key words: deep dyslexia; phonological activation

Scan, EEG and related measures

Bilateral carotid angiogram

Standardized assessment

Token test, Schonell reading and spelling, Boston Diagnostic Aphasia Examination

Other assessment

Picture naming, naming from description, letter, word and non-word reading, visual lexical decision

Lesion location

- Not mentioned

Lesion type

DE — total occlusion of the left internal carotid artery
PW — CVA

Language

English

Interpreting a case of Japanese phonological alexia: the key is in phonology

K. Patterson, T. Suzuki and T. N. Wydell

Abstract

This paper presented a case study of KT, a Japanese male (aged 70 years) who displayed a striking phonological alexia after a stroke. KT's accuracy in reading real Japanese kanji or kana words was essentially normal. However, when asked to read simple 2–3 character kana strings with orthographically and phonologically unfamiliar form (non-words), on which normal Japanese readers easily score 100%, the patient consistently failed to produce a single correct response. The introduction of phonological familiarity (i.e., creating non-words homophonic with real words) produced a dramatic facilitation of KT's non-word reading, and this marked pseudo-homophone effect furthermore interacted with both frequency and concreteness of the words whose pronunciations were mimicked in the non-words. KT also showed prominent deficits and lexicality effects in phonological tasks such as segmentation and blending that involve no orthographic processing. His pattern of language and reading performance is interpreted as a deficit in which pathologically reduced activation of phonological representations has differential consequences for word and non-word production.

Journal

Cognitive Neuropsychology 1996; 13: 803–22

Neurocase Reference Number:

P670

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

KT

Key theoretical issue

- The reading impairment in many phonological dyslexic patients can be explained entirely on the basis of a more general phonological deficit

Key words: Japanese phonological dyslexia

Scan, EEG and related measures

Not mentioned

Standardized assessment

Digit span (in Japanese)

Other assessment

Picture naming, reading of words written in kanji (Japanese morphograms) or kana (Japanese syllabograms), reading of non-words written in kana, writing of single kana characters and kana non-words to dictation, transcription between hiragana and katakana characters, non-word repetition, phonological segmentation and blending

Lesion location

- Territory of the left middle-cerebral artery

Lesion type

CVA

Language

English

Reading with one hemisphere

K. Patterson, F. Vargha-Khadem and C. E. Polkey

Abstract

The subjects of this study were two originally right-handed teen-aged girls who had undergone complete hemispherectomy (1 left, 1 right) for intractable epilepsy. Both subjects had developed normal language and reading capacities before the onset of their illness. The reading performance of HP (whose right hemisphere had been removed), while not as advanced in level as that of a normal 17-year-old, showed no abnormalities in any subcomponent of reading skill. The reading performance of NI (whose left hemisphere had been removed) was poor, but with a pattern of retained and impaired subskills strikingly similar to adult deep dyslexic patients and to split-brain patients given reading tasks lateralized to the left visual field (right hemisphere). The results are discussed with regard to implications for the reading capacity of the non-dominant right hemisphere and also its putative contribution to normal reading.

Journal

Brain 1989; 112: 39–63

Neurocase Reference Number:

P671

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

HP and NI

Key theoretical issue

- The role of the right hemisphere in deep dyslexia

Key words: right hemisphere hypothesis; deep dyslexia; hemispherectomy

Scan, EEG and related measures

EEG, CT

Standardized assessment

WISC-R, Schonell Graded Word Reading test, British Picture Vocabulary Scale, Pyramids and Palm Trees test

Other assessment

Letter, number, word and non-word reading. Cross-case matching. Visual lexical decision. Non-word repetition. Auditory rhyme judgments, rhyme production, phoneme deletion and addition. Written and spoken word-picture matching

Lesion location

- Complete left hemispherectomy

Lesion type

Complete left hemispherectomy following Rasmussen's encephalitis

Language

English

An acquired form of developmental phonological dyslexia

N. J. Pitchford and E. Funnell

Abstract

The authors report a longitudinal investigation of the development of reading in a child (DB) who suffered a left-hemisphere stroke in the early stages of reading acquisition. Reading development was monitored over a 4-year period using tests given on three occasions. Standardized reading tests showed that DB's reading problems became more pronounced with age and a specific reading disorder evolved. Her performance on orthographic and phonological reading tests revealed a complex pattern of development over time, consistent with a phonological reading disorder, that was principally characterized by deficient non-word reading. Her segmentation skills were initially impaired but improved to a normal level over time. Furthermore, she showed a marked reduction in the effects of spelling-sound regularity on word reading that were typical for her reading age and she produced significantly more lexical errors than reading-age controls, suggesting that she used mainly lexical strategies for word reading. Her sublexical processes were primitive and were generally applied only to stimuli that were stated to be non-words. The authors suggest that DB had established an acquired form of developmental phonological dyslexia; the first such case to be reported.

Journal

Cognitive Neuropsychology 1999; 16: 573-87

Neurocase Reference Number:

P672

Primary diagnosis of interest

Phonological dyslexia following childhood CVA

Author's designation of case

DB

Key theoretical issue

- Charting the course of reading development in a single case following childhood CVA

Key words: phonological dyslexia; childhood CVA; developmental

Scan, EEG and related measures

CT and MRI

Standardized assessment

Children's Graded Naming Test, British Picture Vocabulary Scale, Test for the Reception of Grammar (TROG), WISC-R, Schonell Graded Word Reading Test, The British Ability Scales Test of Single Word Reading

Other assessment

Semantic association judgement, Forwards and backwards digit span, Word and non-word reading, Phonological awareness tests — segmentation and deletion

Lesion location

- CT (4 days post onset) — large area of oedema in the anterior part of the left middle cerebral artery territory
- MRI (3 years post onset) — Widening of the left sylvian fissure and ipsilateral lateral ventricle. Gliosis in the white matter adjacent to the tip of the left frontal horn

Lesion type

CVA

Language

English

A functional neuroimaging description of two deep dyslexic patients

C. J. Price, D. Howard, K. Patterson,
E. A. Warburton, K. J. Friston and
S. J. Frackowiak

Abstract

Deep dyslexia is a striking reading disorder that results from left-hemisphere brain damage and is characterized by semantic errors in reading single words aloud (e.g., reading 'spirit' as 'whisky'). Two types of explanation for this syndrome have been advanced. One is that deep dyslexia results from a residual left-hemisphere reading system that has lost the ability to pronounce a printed word without reference to meaning. The second is that deep dyslexia reflects right-hemisphere word processing. Although previous attempts to adjudicate between these hypotheses have been inconclusive, the controversy can now be addressed by mapping functional anatomy. In this study, the authors demonstrate that reading by two deep dyslexic patients (CJ and JG) involves normal or enhanced activity in spared left-hemisphere regions associated with naming (Broca's area and the left posterior inferior temporal cortex) and with the meanings of words (the left posterior temporo-parietal cortex and the left anterior temporal cortex). In the right-hemisphere homologues of these regions, there was inconsistent activation within the normal group and between the deep dyslexic patients. One (CJ) showed enhanced activity (relative to the normals) in the right anterior inferior temporal cortex, the other (JG) in the right Broca's area, and both in the right frontal operculum. Although these differential right-hemisphere activations may have influenced the reading behaviour of the patients, their activation patterns primarily reflect semantic and phonological systems in spared regions of the left hemisphere. These results preclude an explanation of deep dyslexia in terms of purely right-hemisphere word processing.

Journal

Journal of Cognitive Neuroscience 1998; 10: 303-15

Neurocase Reference Number:

P673

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

CJ and JG

Key theoretical issue

- Does deep dyslexia reflect residual processing within the left hemisphere, or word processing within the right hemisphere?

Key words: deep dyslexia; right hemisphere hypothesis; positron emission tomography (PET)

Scan, EEG and related measures

PET and MRI

Standardized assessment

Pyramid and Palm Trees test, PALPA synonym judgement and word-picture matching

Other assessment

Spoken and written synonym judgement, picture naming, word and non-word reading

Lesion location

- JG — large perisylvian lesion encompassing the majority of the region supplied by the left middle cerebral artery and including the left temporo-parietal cortex and the left inferior and middle frontal cortices
- CJ — large lesion involving the left temporo-parietal cortex

Lesion type

JG — CVA

CJ — head injury

Language

English

Reading lexically without semantics: evidence from patients with probable Alzheimer's disease

A. M. Raymer and R. S. Berndt

Abstract

Recent modifications of the lexical model of oral reading make the prediction that under conditions where sublexical reading processes alone cannot achieve the target pronunciation (i.e., when words have exceptional spellings or when sublexical processes are impaired), patients with severe semantic impairment should have more difficulty reading aloud semantically impaired words than semantically retained words. In a battery of lexical-semantic and reading tasks, two neurologically normal control subjects and two subjects with probable Alzheimer's disease (AD) and only moderate semantic impairment read aloud all words accurately. One AD subject with severe semantic impairment was impaired in word reading, but demonstrated no difference in reading words with regular and exceptional spellings. Another AD subject with severe semantic impairment read aloud without error virtually all regular and exception words. The latter two subjects showed impaired reading of non-words. Neither severely impaired AD subject demonstrated any relationship between oral reading accuracy and semantic knowledge of exception words. These findings support a model of word reading incorporating lexical, non-semantic processes by which lexical orthographic input representations directly activate lexical phonological output representations without the necessity of semantic mediation.

Journal

Journal of the International Neuropsychological Society 1996; 2: 340-9

Neurocase Reference Number:

P674

Primary diagnosis of interest

Semantic impairment, Alzheimer's disease

Author's designation of case

1. SC
2. MB

Key theoretical issue

- Models of reading aloud should incorporate a lexical non-semantic route

Key words: acquired dyslexia; dementia; semantic impairment

Scan, EEG and related measures

None reported

Standardized assessment

Mattis Dementia Rating Scale

Other assessment

Matching upper and lower case words, matching different line drawings of the same object, word repetition, non-word repetition, visual lexical decision, picture naming, naming to auditory definition, reading regular and exception words and non-words, written word to picture matching, written word to associated picture matching, picture to associated picture matching, category sorting

Lesion location

- Not stated

Lesion type

Not stated

Language

English

The effect of word imageability in acquired dyslexia

J. T. E. Richardson

Abstract

Subjects with acquired dyslexia sometimes find abstract words more difficult to read than concrete words. Two experiments investigated the bearing of this finding upon contemporary discussions of imagery. It was found that the reading performance of a single dyslexic correlated with the imageability of the reading material, but not with its concreteness. His errors were more likely to be semantically related to the correct responses when the material was imageable. It is suggested that he adopts the strategy of making up a mental image corresponding to the presented word, and naming the object imaged.

Journal

Neuropsychologia 1975; 13: 281-8

Neurocase Reference Number:

P675

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

GR [see Marshall and Newcombe, 1973 (P656)]

Key theoretical issue

- The role of imageability on reading accuracy and semantic paralexia in deep dyslexia

Key words: imageability; concreteness; deep dyslexia; semantic paralexia

Scan, EEG and related measures

Not mentioned

Standardized assessment

Not mentioned

Other assessment

Reading aloud

Lesion location

- Left temporo-parietal

Lesion type

Missile wound

Language

English

Loss of deep dyslexic reading ability from a second left-hemispheric lesion

D. P. Roeltgen

Abstract

It has been hypothesized that the residual reading ability in people with deep dyslexia (an acquired dyslexia in which the subjects make semantic paralexias, e.g., child read as boy) utilizes right hemispheric structures. A patient who had deep dyslexia following an initial left hemispheric stroke was studied. Following a new left hemispheric stroke, he lost his residual reading ability. In this patient, deep dyslexic reading abilities were dependent on left hemispheric structures.

Journal

Archives of Neurology 1987; 44: 346–8

Neurocase Reference Number:

P676

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

Not mentioned

Key theoretical issue

- In contrast with the right hemisphere hypothesis, the left hemisphere can support residual reading abilities in deep dyslexia

Key words: deep dyslexia; right hemisphere hypothesis

Scan, EEG and related measures

CT

Standardized assessment

Western Aphasia Battery, Peabody Individual Achievement Test, Battery of Linguistic Analysis of Writing and Reading, Battery of Adult Reading Function, Reading Comprehension Battery for Aphasia

Other assessment

Reading single words, reading words in paragraphs, rhyme judgements, non-word repetition

Lesion location

- 1. Prior to commencement of study: left cerebral infarction. CT following subsequent infarction indicated that the earlier one involved two lesions: (i) a large lesion in the left posterior temporoparietal region, involving the cortex surrounding the posterior half of the superior temporal sulcus as well as the angular gyrus, and extended subcortically to the lateral ventricle; (ii) a small right frontal lesion, involving part of the inferior frontal gyrus, the lower half of the precentral gyrus, and part of the mid and anterior insula cortex
- 2. CT: the lesion resulting from the subsequent infarction was in the left frontoparietal region, and involved the lower portions of the precentral and postcentral gyri, the insula cortex, the posterior half of the superior temporal gyrus, and part of the body of the caudate nucleus

Lesion type

Infarction

Language

English

Two cases of deep dyslexia in unilingual Hispanophone aphasics

A. Ruiz, A. I. Ansaldo and A. R. Lecours

Abstract

First, the paper reiterates that the Spanish written code is transparent to the point of entailing full graphophonemic conversion, i.e. reading behaviour is possible without access to one's memory of written words. The Ardila claim that certain clinical forms of acquired reading disorders which have been reported to occur among various cultural subgroups do not occur among unilingual readers of Spanish is then summarized. This is followed by two brief case reports of acquired aphasia in native speakers and fluent readers of Spanish; prototypical 'deep dyslexia' was documented to exist in both cases.

Journal

Brain and Language 1994; 46: 245–56

Neurocase Reference Number:

P677

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

ON and MG

Key theoretical issue

- Nature of deep dyslexia in Spanish, unilingual speakers

Key words: deep dyslexia; orthographic transparency; Spanish aphasics

Scan, EEG and related measures

CT

Standardized assessment

Western Aphasia Battery

Other assessment

Word reading

Lesion location

- ON — left frontoparietal subcortical infarct extending to the internal capsule
- MG — left Sylvian frontotemporoparietal corticosubcortical infarct

Lesion type

CVA

Language

English

Reading in deep dyslexia is not ideographic

E. M. Saffran

Abstract

Results from a study with four 14–54-year-old patients with deep dyslexia indicate that patients who were unable to read by use of spelling–sound correspondence rules had the capacity to read words presented in unusual configurations. Results suggest that patients used an orthographic reading mechanism that is based on letter information rather than overall configuration.

Journal

Neuropsychologia 1980; 18: 219–23

Neurocase Reference Number:

P678

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

1. VS [see also Saffran and Marin, 1977 (P679)]
2. HT
3. BL
4. WS

Key theoretical issue

- Reading in deep dyslexia is not based on matching the graphemic stimulus with a stored visual configuration, as patients had little difficulty reading familiar words in unfamiliar configurations. Instead deep dyslexics may rely on an orthographic reading mechanism in which letter strings, encoded in some abstract form, are matched to stored orthographic representations

Key words: deep dyslexia

Scan, EEG and related measures

1. CT
2. CT
3. EEG
4. CT

Standardized assessment

Peabody Picture Vocabulary Test

Other assessment

Reading of words presented in three formats of presentation: normal lower case, mixed case, vertical

Lesion location

- 1. Left posterior temporoparietal, extending anteriorly to insula. Large deep lesion
- 2. Left parietal, temporal, inferior frontal. Large deep lesion
- 3. Left hemisphere
- 4. Left temporal, parietal, frontal. Large lesion. Metallic fragments lodged in right hemisphere. Bullet lodged in right anterior temporal area

Lesion type

1. CVA
2. CVA
3. CVA
4. Missile wound, left middle cerebral artery ligation

Language

English

Reading without phonology: Evidence from aphasia

E. M. Saffran and O. S. M. Marin

Abstract

This study of an aphasic dyslexic supports the view that there are separate visual and phonological pathways in reading. The patient retained a reading vocabulary of at least 16 500 words although she was unable to perform operations that critically depend on grapheme-to-phoneme conversion; these included reading nonsense words, recognizing rhymes and homophones, and accessing lexical entries from homophonic spellings such as 'kote'. Typographical variation such as mixed presentation, did not interfere with her reading performance, which suggests that it is mediated by letter identification rather than by a wholistic method of word recognition. The total performance pattern strongly suggests that this patient identifies words by matching particular letter-strings to their corresponding meanings.

Journal

Quarterly Journal of Experimental Psychology 1977; 29: 515–25

Neurocase Reference Number:

P679

Primary diagnosis of interest

Deep dyslexic

Author's designation of case

VS [see also Saffran, 1980 (P678)]

Key theoretical issue

- The possible mediating role of semantics and phonology in deep dyslexia

Key words: deep dyslexia; sublexical reading; reading via meaning

Scan, EEG and related measures

EMI

Standardized assessment

Boston Diagnostic Aphasia Examination, Token test, Peabody Picture Vocabulary Test

Other assessment

Writing to dictation, word and non-word reading, spoken–written non-word matching, written rhyme and homophone judgement, visual lexical decision

Lesion location

- Extensive lesion of the posterior temporal region of the left hemisphere extending into the occipital lobe and deep white matter

Lesion type

CVA

Language

English

Deep dyslexia in a patient with crossed aphasia

G. Sartori, S. Bruno, M. Serena and P. Bardin

Abstract

A single case study of a 33-year-old right-handed man who suddenly developed left hemiplegia and non-fluent aphasia is reported. Extensive testing of the patient's reading ability revealed the symptom complex of deep dyslexia. The relevance of crossed deep dyslexia in a reader of Italian is discussed.

Journal

European Neurology 1984; 23: 95–9

Neurocase Reference Number:

P680

Primary diagnosis of interest

Italian deep dyslexia, crossed aphasia

Author's designation of case

Leonardo

Key theoretical issue

- Investigation of deep dyslexia in a patient, with crossed aphasia, who is a reader of a language with a phonologically shallow orthography (Italian)

Key words: deep dyslexia; crossed aphasia

Scan, EEG and related measures

CT, angiography

Standardized assessment

Edinburgh Handedness Inventory, shortened version of Token Test, BDAE (in Italian), WAIS, Benton Visual Retention Test

Other assessment

Spontaneous speech, picture naming, auditory word–picture matching, written word–picture matching, comprehension of spoken commands, repetition of letters, syllables, words, non-words and sentences, naming single letters, reading words and non-words, reading of words and non-words with tachistoscopic presentation to right and left visual fields

Lesion location

- CT: Large area of hypodensity in the right temporoparietal region close to and compressing the outer wall of the lateral right ventricle

Lesion type

CVA

Language

English

Phonological alexia in Japanese: a case study

S. Sasanuma, H. Ito, K. Patterson and T. Ito

Abstract

A pattern of highly selective impairment in reading non-words is described in a Japanese patient, TY, who achieved essentially normal performance on most of a range of other language abilities tested. Other prominent features of TY's reading were: (1) almost flawless reading of all types of familiar words in both kanji and kana; (2) differential performance, both quantitative and qualitative, on 3 types of non-words constructed by altering real words in various ways; (3) dramatic improvement in pronunciation of orthographic non-words with phonologically familiar pronunciations (pseudo-homophones); and (4) from near-normal to impaired performance on different types of mora-based phonological manipulation tasks. With reference to the so-called 'triangle' framework of reading (Plaut *et al.*, Psychological Review 1996; 103: 56–115; Seidenberg and McClelland, Psychological Review 1989; 96: 523–68), these characteristics are interpreted to arise from an impaired phonological system in which activation tends to fall into familiar patterns corresponding to real words. An alternative account of TY's performance in terms of the recent dual-route cascaded model (Coltheart *et al.*, Psychological Review 1993; 100: 589–608) is also discussed.

Journal

Cognitive Neuropsychology 1996; 13: 823–48

Neurocase Reference Number:

P681

Primary diagnosis of interest

Phonological alexia

Author's designation of case

TY

Key theoretical issue

- Nature of phonological alexia in a Japanese reader, and the role of phonological impairment in phonological alexia

Key words: phonological alexia; phonological dyslexia; phonological impairment; kanji; kana; mora

Scan, EEG and related measures

CT

Standardized assessment

Token test

Other assessment

Picture naming, word and sentence repetition, reading, repetition and spelling to dictation of words and non-words, forwards and backwards digit span, word–picture matching, phonological (mora) manipulation tasks

Lesion location

- CT — few small-sized, low-density areas scattered around the anterior horn of the left lateral ventricle

Lesion type

Thrombosis in the left frontal middle cerebral artery

Language

English

Right hemisphere contribution to lexical access in an aphasic with deep dyslexia

A. Schweiger, E. Zaidel, T. Field and B. Dobkin

Abstract

Three hemifield tachistoscopic studies of a right-handed patient with acquired Broca's aphasia and deep dyslexia, but with intact visual fields, are presented to support the hypothesis of right hemisphere (RH) participation in deep dyslexic reading. A systematic comparison of this deep dyslexic with the disconnected RHs of two patients with complete cerebral commissurotomy disclosed a similar, but not identical, pattern of abilities. The results demonstrate partial reliance on the RH for accessing the meaning of single words, but not for phonological encoding in this patient.

Journal

Brain and Language 1989; 37: 73–89

Neurocase Reference Number:

P682

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

RW

Key theoretical issue

- The role of the right hemisphere in the reading of patients with deep dyslexia

Key words: deep dyslexia; right hemisphere hypothesis

Scan, EEG and related measures

CT

Standardized assessment

WAIS block design, Raven's Coloured Progressive Matrices, Western Aphasia Battery, Token test

Other assessment

Street picture completion test, figure copying, word and non-word reading, word–picture matching, written rhyme judgements, visual lexical decision

Lesion location

- Large left hemisphere lesion in the territory of the left middle cerebral artery, extending anteriorly into the posterior-inferior frontal lobe and underlying white matter, and posteriorly through the superior aspect of the temporal lobe to the parietal lobe

Lesion type

Traumatic occlusion of the left internal carotid artery, extending to and obstructing the stem of the middle cerebral artery

Language

English

Modality specific word comprehension deficits in deep dyslexia

T. Shallice and A. K. Coughlan

Abstract

A deep dyslexic patient was tested on a series of experiments designed to assess her comprehension of abstract words. On tests where a precise semantic representation of words was required, performance was much poorer with visual than with auditory presentation. However, on some but not all categorization tests performance with both modalities was good. It is argued that deep dyslexia can result from a modality-specific deficit in attaining the meaning of words together with a disorder of the phonological reading route.

Journal

Journal of Neurology, Neurosurgery, and Psychiatry 1980; 43: 866–72

Neurocase Reference Number:

P683

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

PS

Key theoretical issue

- Highlighting and evaluating a modality-specific comprehension deficit in a case of deep dyslexia

Key words: modality-specific word comprehension deficit; deep dyslexia

Scan, EEG and related measures

Visual inspection during debridement and later acrylic cranioplasty

Standardized assessment

WAIS, Raven's Progressive Matrices, Boston Diagnostic Aphasia examination, Token test, Schonell Graded Word Reading Test, Schonell Graded Word Spelling Test

Other assessment

Picture naming and naming to description. Repetition. Forward and backward digit span. Story recall, face and word recognition memory tests. Dichotic listening. Unusual views recognition test. Word and non-word reading. Visual and spoken lexical decision. Visually presented rhyme judgement. Spoken-to-written word matching. Word–picture matching. Spoken and written word sorting and synonym judgement

Lesion location

- Severe contusion in the left fronto-temporo-parietal region, 2×3 cm area of tissue resected, mainly from the posterior aspect of the inferior frontal gyrus (Broca's area). Later inspection during cranioplasty showed considerable atrophy of the left temporal lobe had taken place

Lesion type

Head injury with compound, depressed fracture

Language

English

Word recognition in a phonemic dyslexic patient.

T. Shallice and E. K. Warrington

Abstract

The systems underlying word recognition were investigated in a single case study of a patient with an acquired dyslexia. His reading performance was related to parts of speech, word frequency and word concreteness, and his reading errors were analysed. There was a very striking difference between his ability to read concrete and abstract words. Furthermore visual errors, which could not be attributed to a deficit at a peripheral level, predominated; phonemic errors did not occur. It is argued that these findings support a dual encoding model of word recognition, the present case illustrating the impairment of the phonemic route, a direct grapheme–semantic route being relatively spared. These findings and interpretation are for the most part consistent with Marshall and Newcombe's (1973; P656) studies of acquired dyslexia. The present findings are discussed in terms of more general theories of word recognition.

Journal

Quarterly Journal of Experimental Psychology 1975; 27: 187–99

Neurocase Reference Number:

P684

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

KF (see also Warrington and Shallice, Brain 1979; 92: 885–96)

Key theoretical issue

- Nature of reading in a deep (phonemic) dyslexic and the implications for models of word reading

Key words: deep dyslexia; dual route model for word recognition/reading

Scan, EEG and related measures

Visual inspection during craniotomy

Standardized assessment

Schonell graded reading test

Other assessment

Word reading

Lesion location

- Left parietal lobe

Lesion type

Head injury

Language

English

When reading a sentence is easier than reading a 'little' word: the role of production processes in deep dyslexics' reading aloud

N. Silverberg, G. Vigliocco, D. Insalaco and M. Garrett

Abstract

Deep dyslexia is an acquired reading disorder. Investigations of this disorder have focused primarily on the error pattern for single words read aloud. An essential characteristic of deep dyslexia is a profound inability to read closed class elements. In Garrett's language production model, closed and open class words are retrieved by distinct mechanisms: open class elements are retrieved independently of their phrasal environment, but closed class words are integral parts of phrase structure. This study's expectation was that if syntactic environments supporting closed class are available to deep dyslexic readers, their ability to read closed class words might improve. Two English speaking patients and one Italian speaking patient were tested using a test and list format manipulation. All three were significantly better at reading closed class words presented in text format than list format. Open class words that are generally read poorly (e.g. verbs) did not show similar improvements.

Journal

Aphasiology 1998; 12: 335–56

Neurocase Reference Number:

P685

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

ML, VP, SS

Key theoretical issue

- Effect of context on reading of open and closed class words in deep dyslexia

Key words: deep dyslexia; closed class; open class; Italian

Scan, EEG and related measures

CT

Standardized assessment

PALPA

Other assessment

Word, non-word and sentence reading

Lesion location

- ML — large hypodensity covering frontal, temporal and part of the parietal lobes on the left side
- VP — left dorsolateral frontal areas, including the frontal and pre-central gyrus, part of the parietal lobe and the anterior portion of the superior temporal gyrus
- SS — large hypodensity in the left fronto-temporal and parietal lobes

Lesion type

ML — haemorrhage caused by arterio-venous malformation

VP — CVA

SS — haemorrhage and surgery following head injury

Language

English

Different neural circuits subserve reading before and after therapy for acquired dyslexia

S. L. Small, D. K. Flores and D. C. Noll

Abstract

Rehabilitative measures for stroke are not generally based on basic neurobiological principles, despite evidence from animal models that certain anatomical and pharmacological changes correlate with recovery. In this report, the authors use functional magnetic resonance imaging (fMRI) to study *in vivo* human brain reorganization in a right-handed patient with an acquired reading disorder from stroke. With phonological dyslexia, her whole-word (lexical) reading approach included inability to read non-words and poor reading of function words. Following therapy, she was able to read non-words and function words, and preferred a decompositional (sub-lexical) strategy in general. fMRI was performed during a reading task before and after treatment. Prior to therapy, her main focus of brain activation was in the left angular gyrus (area 39). After therapy, it was instead in the left lingual gyrus (area 18). This result suggests first that it is possible to alter brain physiology with therapy for acquired language disorders, and second, that two reading strategies commonly used in normal reading use distinct neural circuits, possibly reconciling several conflicting neuroimaging studies of reading.

Journal

Brain and Language 1998; 62: 298–308

Neurocase Reference Number:

P686

Primary diagnosis of interest

Phonological dyslexia

Author's designation of case

Not mentioned

Key theoretical issue

- Teaching a phonological dyslexic patient how to make grapheme to phoneme correspondences led to functional neuroanatomical changes which were detectable with fMRI. Lexical and sublexical reading use distinct neuroanatomical substrates

Key words: phonological dyslexia; therapy; neuroanatomy of reading

Scan, EEG and related measures

fMRI

Standardized assessment

Reading version of the Token Test

Other assessment

Monitoring for a square above a circle when shown tokens

Lesion location

- Left fronto-temporal

Lesion type

Ischaemic stroke

Language

English

Simultaneous activation of reading mechanisms: evidence from a case of deep dyslexia

M. H. Southwood and A. Chatterjee

Abstract

The authors report the performance of LC, a 34-year-old female deep dyslexic. The authors investigated extensively her errors according to serial cognitive neuropsychological models of oral reading. Initial evaluation of her reading suggested impaired access to the phonological output lexicon (POL). Impaired grapheme-to-grapheme conversion (GPC) and semantic errors in reading suggested that LC read via an impoverished semantic route. However, a serial model of oral reading could not explain error differences in reading, picture naming, spontaneous speech, and repetition. Neologisms occurred in oral reading but not in spontaneous speech and repetition. Semantic errors in naming exceeded those in oral reading. To account for these different error patterns the authors propose that the semantic route, the direct route from the orthographic input lexicon to the POL, and GPC activate simultaneously during reading, converging at the POL to constrain phonological selection. These routes are modular but not functionally encapsulated. For LC, the POL receives ambiguous information due to degradation of all routes, causing reading errors.

Journal

Brain and Language 1999; 67: 1–29

Neurocase Reference Number:

P687

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

LC

Key theoretical issue

- Correct pronunciation of a written word results from integration of information supplied to the phonological output lexicon by all three reading mechanisms (grapheme-to-phoneme conversion, the semantic route, and the direct route from the orthographic input lexicon to the phonological output lexicon)

Key words: deep dyslexia; serial models of reading

Scan, EEG and related measures

CT, MRI

Standardized assessment

Western Aphasia Battery, Token Test, Boston Naming Test, Action Naming Test, verbal fluency, California Verbal Learning Test, Wisconsin Card Sorting Test, Battery of Adult Reading Function, Pyramids and Palm Trees Test

Other assessment

Non-word reading, cross-case letter matching, cross-case letter string matching, visual lexical decision, auditory lexical decision, matching pseudo-homophones to pictures, visual rhyme judgement, auditory rhyme judgement, homophone picture matching, non-word repetition, word repetition, spontaneous speech

Lesion location

- MRI: extensive left-sided lesion involving the posterior half of the middle temporal gyrus, most of the angular gyrus, part of the supramarginal gyrus and some of area 19

Lesion type

Aneurysm

Language

English

Analysis of reading in a case of deep dyslexia

R. Valiani, D. L. Spitaleri and A. M. Fasanaro

Abstract

An Italian patient affected by deep dyslexia and Broca's aphasia was submitted to evaluation of reading and language with the aim to define which stages of the reading process were damaged. The patient showed a variety of impairments in the reading tasks that can be attributed: (1) to damage of the central mechanisms of grapheme to phoneme conversion, and (2) to damage of the connection between the recognition system and the system used to produce words. Additional damage was found in the semantic system. Furthermore, the impairment shown by the patient in both the tasks of reading and repeating non-words suggests the existence of a single phonological processor. (English and Italian abstract.)

Journal

Acta Neurologica 1988; 10: 286–94

Neurocase Reference Number:

P688

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

AA

Key theoretical issue

- To identify the stages of the reading process that were compromised in this case of deep dyslexia, and to verify the role played by the phonological system

Key words: deep dyslexia; Broca's aphasia; grapheme–phoneme conversion; impaired phonological processing

Scan, EEG and related measures

CT

Standardized assessment

Raven's Coloured Progressive Matrices, Token test, Wechsler digit span

Other assessment

Picture naming, word–picture matching, repetition, oral spelling, spelling to dictation, letter and word copying, word span, phonemic span, graphemic span, verbal learning. Letter, syllable, word and non-word reading. Same-different letter and non-word judgements. Written and spoken lexical decision. Spoken-to-written word and non-word matching

Lesion location

- Large hypodense area in the left parieto-temporal region

Lesion type

Not mentioned

Language

English

Semantic access dyslexia

E. K. Warrington and T. Shallice

Abstract

An analytical investigation of the residual reading capacities of a single patient with dyslexia without dysgraphia is reported. Both his ability to name and to comprehend letters and words was severely impaired. The major finding of this investigation was AR's striking capacity for categorizing words he could not read. In addition there was evidence of semantic priming effects. Thus AR was frequently able to achieve partial comprehension of words he could not read. The orthodox interpretation of the dyslexia without dysgraphia in terms of a disconnection syndrome is shown to be inappropriate, at least for the present case, where the deficit appears to be within the semantic domain; it is argued that this type of dyslexia is due to an impairment in accessing semantic information.

Journal

Brain 1979; 102: 43–63

Neurocase Reference Number:

P689

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

AR

Key theoretical issue

- Modality-specific deficit to comprehension

Key words: deep dyslexia; semantic access dyslexia; disconnection syndrome; dyslexia without dysgraphia

Scan, EEG and related measures

Carotid angiogram, Stereopaque

Standardized assessment

WAIS, Progressive Matrices

Other assessment

Picture naming, naming to description, letter and number reading and matching, word and non-word reading, written word categorization

Lesion location

- Left parietal

Lesion type

Intracerebral abscess

Language

English

Deep dyslexia and right hemisphere reading—a regional cerebral blood flow study

B. Weekes, M. Coltheart and E. Gordon

Abstract

The right hemisphere (RH) hypothesis proposes that in deep dyslexia the patient is not reading with an impaired version of the normal left hemisphere (LH) reading system, and cannot use that system for reading at all. Instead, a different reading system located in the RH is used. The RH hypothesis was examined by investigating the amount of cortical activation in the left and right cerebral hemispheres of a 25-year-old deep dyslexic female patient (L.H.) during visual word recognition. Three experimental tasks were devised to isolate a visual word recognition process and a spoken word production process, and these tasks were administered to the deep dyslexic patient as well as another 30-year-old male patient with left hemisphere (LH) damage but a different form of acquired dyslexia (surface dyslexia) and two matched control patients. Regional cerebral blood flow (rCBF) was monitored during performance on each of the tasks. For L.H., but not the other three patients, rCBF in the RH was greater than in the LH during visual word recognition. By contrast, there was greater activation of the LH than the RH for L.H. during spoken word production; this was also true of the other three patients, but the effect was statistically significant only for L.H. These results support the RH hypothesis of deep dyslexia.

Journal

Aphasiology 1997; 11: 1139–58

Neurocase Reference Number:

P690

Primary diagnosis of interest

Deep dyslexia

Author's designation of case

LH

Key theoretical issue

- Does deep dyslexia reflect the processing of a right hemisphere reading system?

Key words: deep dyslexia; right hemisphere hypothesis; regional cerebral blood flow (rCBF)

Scan, EEG and related measures

CT, MRI, Xenon-133 regional cerebral blood flow

Standardized assessment

PALPA

Other assessment

Cross-case matching, visual and spoken lexical decision, repetition of words and non-words, picture naming, word–picture matching. Word and non-word reading and writing to dictation

Lesion location

- MRI — bilateral dilation of the lateral ventricles, more prominent on the left. Prominent gyral pattern over the left parietal lobe and increased intensities within the left parietal and posterior temporal subcortical structures

Lesion type

Head injury

Language

English