

photographs of certain famous faces. His performance on the fragmented letters test¹ of visual perception was, however, impaired. On the cube analysis test¹ of visuospatial analysis his performance suggested that he was able to integrate stimuli (cubes) into spatial (three dimensional) schemas but he obtained a low score apparently due to omissions associated with neglect. He was able to draw a cube (without a model), making only slight mislocations of certain lines depicting depth.

From the time of his admission to the hospital our patient presented with a profound difficulty in telling the time from a clock (or a watch), even when the clock showed a simple "on the hour" time. We investigated this impairment in two experimental sessions, two weeks and four weeks after his admission. In each session the following four conditions were used, involving *time telling* or *clock setting* for eight different "on the hour" times, chosen to represent equally the numbers on the left and right hand side of the clock. Each of eight "on the hour" times was presented twice in a random order. (1) The patient was shown a drawn clock face (diameter 12.5 cm) indicating an "on the hour" time. He was asked first to name the time, then to report the position of the clock hands and, finally, to tell the time depicted on the clock. His performance was scored as correct if he gave the appropriate answer before or after identifying the positions of the clock hands; his scores in the two sessions were: 3/16 and 0/16 (correct). (2) He was shown a drawn clock face minus the hands on which he was required to insert the hands to depict a verbally given on the hour time; he scored 16/16 (correct) in both sessions. (3) The positions of the hands for an on the hour time were described verbally to the patient who was then required to say what that time was; his scores in the two sessions were 4/16 and 6/16 (correct). (4) He was given the time verbally and was then asked to say in which positions the hands should be; his scores were: 16/16 and 15/16 (correct). The results from these experiments clearly indicate a dissociation between his virtually errorless performance in conditions (2) and (4) where the response involved clock setting and his very poor performance in condition (1) where the response involved time telling from the clock face. His deficit in condition (1) occurred despite consistently accurate and unhesitating identification of the positions of the hands. When he was shown a clock face and asked to name the time, he seemed rather bewildered and reluctant to respond to the question. With encouragement he would refer to the "12" to which the long hand was pointing as the hour and the number to which the short hand was pointing as referring to the number of minutes to, or past 12 o'clock. For example, he would refer to "eight o'clock" as "eight minutes to 12" or "eight minutes past 12" and to "four o'clock" as "four minutes to 12" or "four minutes past 12". In condition (3), in which he was asked to tell the time on the basis of verbal information about the positions of the hands, his performance was better than in condition (1) but still impaired. By contrast, in conditions (2) and (4) he would respond readily and accurately, by setting the clock or giving verbally the positions of the short and long hands in the appropriate positions.

Three weeks after the second experimental session his performances in conditions (2), (3), and (4) were virtually perfect and half of his responses in condition (1) were correct.

Deficits in telling the time from a clock face have previously been reported in association with visuospatial neglect² and it would be reasonable to argue that inattention to the left-hand-side underlay our patient's inability to recognise the time on a clock face. Against such an explanation would be the fact that consistently, readily, and without prompting he located accurately the numbers on the left-hand-side of the clock. He was also able to set the time on demand normally, a task that necessitates accurate search of the left-hand-side. Indeed, his satisfactory performance on other tests that are dependent on accurate recognition of (non-degraded) visual stimuli suggested that his visuospatial neglect was task specific—that is, it was mainly manifested when stimulus arrays were meaningless (for example, cancellation tests) rather than when stimuli were continuous or meaningfully integrated (for example, pictorial material depicting animals, objects, and, presumably, a clock face).³ A particularly striking finding was that he could not identify the time from a clock face on which he himself had only just correctly inserted the hands to depict a specified time. This is akin to certain well established and apparently counter-intuitive neuropsychological syndromes involving other kinds of symbolic activity, such as dyslexia without dysgraphia and selective impairment of auditory comprehension of words in the presence of preserved ability to produce them on demand, or vice versa.⁴ Our data suggest that in the "telling the time" task our patient was unable to access factual knowledge about clocks and time, despite the fact that he had available to him all the relevant information. Exploration of his ability to represent visuospatial relations internally was not possible within the time before his recovery. It is, however, relevant to add that at the time of the first set of experiments he was able to navigate us in a car through a fairly complex route in North London. This finding would normally contradict a significant distortion of visuospatial representations.

As far as we know, this form of transient specific time telling deficit, in the context of accessible information about the positions of the hands on a clock face and intact ability to set the time on demand, has not previously been reported. We would like to suggest that this deficit be referred to as "horologagnosia" (from the Greek meaning an impairment of the ability to tell the time).

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The coin-in-the-hand test: a new "bed-side" test for the detection of malingering in patients with suspected memory disorder

The detection of malingering is an important area of clinical neuropsychological practice, especially in medicolegal settings where it is often necessary to exclude simulation or exaggeration of poor performance.^{1,2} A number of tests have been used by clinicians and researchers to examine the issue of assessment of malingering during memory functioning, including the Rey 15-item visual memory test³ and the symptom validity test.⁴

It is likely that no single test in itself will be sufficient to prove the presence of malingering, and there remains a critical need for further tests to be developed, especially those that are simple and brief to administer and that have relatively high face validity. I describe a simple, brief test designed to detect the presence of malingering in patients who are suspected of simulating poor memory performance. Some of the tests that have so far been developed, such as the Rey 15-item test, may still give impaired performance in some neurological patients with genuine severe memory disorder.⁵ I therefore sought to provide comparative performance on this new test from a group of densely amnesic patients.

Two suspected malingerers were included, both of whom were taking part in medicolegal proceedings and were suspected of simulating poor memory functioning. An amnesic group of five patients was also examined, all of whom had had herpes simplex encephalitis, and were left with a dense amnesia.

The suspected malingerers showed variable, usually low, test scores on general neuropsychological tests, and it was both their clinical presentation and anomalies in test scores that prompted their inclusion in this study. As they both performed at chance level on the test of malingering described later, the reliability of their other neuropsychological test scores must be put in question. For the purposes of this paper, therefore, I have simply presented a brief clinical profile for each case, and the reasons why each case was included in the study.

Case 1 was a right-handed woman in her 40s, who had been working in a professional job. She was involved in an accident, and was claiming compensation for significant psychological and memory difficulties that she considered were present after the accident. She had patchy memory loss for events around the time of the accident, and it was uncertain if this reflected a period of traumatic amnesia or if it was due to a shocked state that resulted from the accident. She indicated that her memory for the day of the event was clearer than her memory for the three to four weeks after the accident. A skull radiograph was reported as normal, a CNS examination showed no

abnormality, and she was discharged home the same day. On memory testing, some aspects of her performance were unusual, including either chance or less than chance performance on the recognition memory test,⁶ a forward digit span of only three items, and a low score (2/5 rows recalled) on the Rey 15-item test.³

Case 2 was a right-handed former business man in his 50s who was in prison and was seeking reduction of his sentence. He complained of impaired memory and concentration. Some cerebral atrophy was shown on CT and MRI scans, raising the possibility of a primary degenerative dementia.

He was at great pains to emphasise the sincerity and "organic" nature of his psychological symptoms. He reported episodes of severe migraine since 1985, and during many of these he indicated that he would have memory loss for a period of 15-30 minutes. When offered examples about possible specific memory symptoms, he indicated that his memory for his childhood was very poor and that his memory for events in his childhood was even poorer than his memory for events that occurred 10 years ago. Despite his current memory symptoms, he was nevertheless able to indicate when he was admitted to hospital and the duration of his hospital admission, the name of his surgeon, the name of the ward, and also the main investigations carried out. He also had atypical memory test scores, including a forward digit span of only three items, with instances of "Ganser-like" approximate answers on this test.

The amnesic group consisted of five patients, mean age 53.2 (range 39-70) years, all of whom had been left with a dense amnesic syndrome after herpes simplex encephalitis. All five patients had a delayed memory quotient of less than 50 on the Wechsler memory scale-revised, and their prorated WAIS-R IQ scores were generally within the normal range (mean 99.8, range 86-114).

The coin-in-the-hand test is presented to subjects in the form of an apparently difficult memory task. It requires them to

remember in which of two hands the examiner has held a coin. After showing the coin for about two seconds in one hand, subjects are required to close their eyes and count backwards from 10. They are then asked to open their eyes and to indicate in which of the two clenched hands the coin is held. The examiner opens the hand touched by the patient and also gives verbal feedback as to the correctness of the subject's response. Ten such trials are given, with the coin being held in the right and left hands for an equal number of trials, these being randomly distributed. (The test was originally designed with counting backwards from 20, but this was later altered to counting backwards from 10. Case 2 received the original version, but I do not think that this had a major effect on the pattern of results.)

Both suspected malingering patients performed around chance level, whereas all patients in the amnesic group performed perfectly, obtaining the maximum score of 10.

Although our coin-in-the-hand test has been shown to be sensitive in detecting malingering in the two patients in this study, it is important to bear in mind general considerations that apply to all tests of suspected malingering in neuropsychological functioning. Firstly, strictly speaking it can only be stated that the patients performed at chance level, and that they were not cooperating fully with the task. The concept of malingering implies a state of mind of the patient, namely a conscious intention to produce impaired performance, and such a state of mind can in the final event only be confirmed by a verbal admission to this effect from the patient. For this reason, it is important to rely on a range of sources of evidence before reaching the conclusion that a particular patient is malingering. Secondly, it is important to remember that evidence to support the existence of malingering may coexist with evidence of cerebral pathology. I have recently examined a patient who suffered a severe head injury, with evidence of frontal lobe damage, and who also performed at the chance level in our coin-in-the-hand test.

She showed a striking lack of concern during the test session, and in this respect differed from the two cases presented here. It may be that her chance performance reflected behavioural problems that resulted in poor cooperation, rather than the direct effects of frontal lobe damage. Although Lishman⁷ refers to an alternative version of the coin-in-the-hand test, which may be useful for the assessment of frontal lobe damage, this is somewhat different from the task described here and there is in fact little hard evidence to back up the localising value of such an alternative version of our task. Also, there is conflicting experimental evidence on the effects of frontal lobe damage on analogous tasks,^{8,9} and further studies on the effects of frontal lobe pathology need to be carried out.

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