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FUNCTIONAL RETROGRADE AMNESIA: A QUANTITATIVE CASE STUDY

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Abstract—The memory impairment of a patient suffering from functional retrograde amnesia was assessed both during the amnesic episode and after its termination. The patient's performance on a task tapping semantic memory was nearly identical on the two test occasions, but his performance on a task tapping episodic memory substantially changed across test sessions. Cueing procedures revealed that in spite of the patient's restricted access to episodic memory during the amnesic period, a relatively intact "island" of episodic memories could be uncovered. The distinction between episodic and semantic memory, as well as the relation between organic and functional retrograde amnesia, are discussed in light of the case study.

INTRODUCTION

RETROGRADE amnesia entails an impairment in the ability to remember events and facts perceived and encoded prior to a critical precipitating incident. In cases of *organic* retrograde amnesia, the precipitating incident usually takes the form of brain disease, head trauma, or electroconvulsive shock. The problem of organic retrograde amnesia was addressed by early students of memory pathology [1, 2], and has received a great deal of attention in recent experimental research [3, 4]. Retrograde amnesia can also occur in the absence of detectable brain pathology as a consequence of severe psychological trauma. This kind of memory impairment is known as *functional* retrograde amnesia. The genesis of functional retrograde amnesia is often dramatic: Patients suddenly become aware that they cannot remember their name, where they live, or anything about their personal past. Functional retrograde amnesia, like its organic counterpart, was described and discussed by some of the most eminent late 19th and early 20th century students of memory pathology (see SCHACTER and TULVING [5] for a review). However, whereas research concerning organic retrograde amnesia has utilized quantitative procedures for describing and analyzing memory performance, there has not yet been, so far as we know, a single study of functional retrograde amnesia that has taken such an approach.

In this article we present a quantitative description of memory performance in a patient suffering from functional retrograde amnesia. In addition, we test the hypothesis, suggested by a number of clinical observations [6, 7], that functional retrograde amnesia entails a differential impairment of episodic and semantic memory. As described by TULVING [8], episodic memory is concerned with information about personal experiences that are tied to unique temporal and spatial contexts. In contrast, semantic memory is concerned with

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general knowledge of facts, rules and concepts that is not linked to specific autobiographical events. The episodic/semantic distinction has proved useful in studies of organic amnesia [9].

In the present case study, we assessed episodic- and semantic-memory performance during the amnesic episode and after its termination. Evidence relevant to the evaluation of the foregoing hypothesis would be provided by comparison of performance on episodic- and semantic-memory tasks on the two test occasions. If semantic memory is relatively unimpaired in functional retrograde amnesia, then there should be little *change* in performance on a semantic-memory task administered during the period of the amnesia and again after the amnesia had ended. However, if episodic memory is selectively impaired in functional retrograde amnesia, then there should be substantial changes in performance on an episodic-memory task administered during and after the amnesia.

CLINICAL INVESTIGATIONS

P.N.

The patient whom we shall refer to as P.N. is a 21-yr-old man with a 10th grade education. The patient had approached a policeman on a street in downtown Toronto complaining of excruciating back pains, and was immediately taken to the emergency room at Mount Sinai Hospital. When questioned at the hospital concerning his personal identity, P.N. became aware that he could not remember his name, address, or almost any other information about himself or his past. He possessed no identifying information. The patient did give a nickname, which we shall refer to as "Lumberjack", and reported working for a courier service about a year prior to admission to the hospital. When contacted, the courier service indicated that P.N. had worked there during the stated time, and also indicated that he had been given the nickname "Lumberjack" by his fellow workers. The patient knew what city he was in and was able to name many of the major downtown streets as well as the names of the local baseball and hockey teams. He also knew the name of the Prime Minister of Canada, and possessed some information about recent political events. The patient's picture was published in a newspaper; a cousin saw it and came to the hospital the next day. She identified the patient, but he did not recognize her. The cousin reported that P.N.'s grandfather had died the previous week and that P.N. had been closer to his grandfather than to any other person. However, P.N. did not recall going to the funeral, and could not remember anything about his grandfather.

P.N.'s amnesia cleared on the next evening while he watched an elaborate cremation and funeral sequence in the concluding episode of the television series *Shogun*. P.N. reported that as he watched the funeral scene, an image of his grandfather gradually appeared in his mind. He then remembered his grandfather's death as well as the recent funeral. During the next few hours, the large sections of his personal past that had been inaccessible for the previous 4 days also returned. After emerging from the amnesic episode, P.N. was unable to recall what had happened to him during the 12 hr prior to the time that he became aware that he did not know who he was. The last thing he remembered was walking at night on a downtown street after his grandfather's funeral in a state of shock and depression.

P.N. was given a variety of neurological and neuropsychological tests shortly after his admission to the hospital. The patient's medical history included a motor vehicle accident at the age of four in which he sustained some damage to the right temporal region. A CT scan revealed evidence of previous right-sided temporal damage, and there was an area of decreased density which probably represented gliosis. No other abnormalities were observed.

Physical examination was largely normal, with the exception of a myelogram that revealed a herniated disk between L5–S1 on the left side. Electromyogram and nerve conduction studies showed evidence of intervention in the S1 root distribution on the left side. A laminectomy performed after P.N.'s amnesia alleviated his back pains.

Several neuropsychological tests were administered both during and after the amnesic episode. Visual scanning, visual constructive ability, manual dexterity, and the patient's performance on tasks requiring attention and abstract thinking were intact. P.N.'s performance on the Wechsler Adult Intelligence Scale (WAIS) and Wechsler Memory Scale (WMS) is presented in Table 1. His verbal I.Q. fell in the middle of the normal range on both test occasions, but performance I.Q. showed some improvement from the first to the second session. This is most likely a practice effect, since the control subject also improved his performance, but not verbal, I.Q. (see below). P.N.'s performance on alternate forms of the WMS showed an overall improvement from the first (M.Q. = 82) to the second (M.Q. = 100) test sessions (Table 1). Part of this improvement can be accounted for by P.N.'s recovery of personal information, and part by his improved performance on the logical memory and paired-associate subtests. The control subject, too, showed a substantial test–retest improvement on the WMS (see below). The test–retest improvement of the control subject, in conjunction with the variable alternate form test–retest reliability of the WMS [10], makes it difficult to unambiguously interpret the patterns of P.N.'s WMS performance. It is worth noting that P.N.'s combined WAIS and WMS profile may not seem typical of a patient with right-sided damage: His performance on

non-verbal tests was slightly higher than on verbal tests. However, P.N.'s right-sided damage was extremely restricted and occurred at an early age. Thus, it is not entirely surprising that there are no detectable right-hemisphere deficits.

P.N. also completed the Minnesota Multiphasic Personality Inventory (MMPI) during and after his amnesia. He obtained elevated scores ($T > 70$) on the hypochondriasis, hysteria, psychopathic deviate and psychasthenia scales on both occasions. There were, however, three notable changes in his MMPI profile across the two sessions: (1) the depression score dropped from a T score of 95 to 79; (2) the paranoia scale was elevated from 59 to 79; (3) the schizophrenia scale was elevated from 78 to 94. These changes suggest that after the amnesia cleared, P.N. became slightly less depressed, although more suspicious, isolated and withdrawn. Clinical examinations during and after the amnesic period revealed no evidence of psychotic behavior.

Control subject

Although the design of our study relies primarily on within-subject comparisons, a between-subject control was also included in order to evaluate the possibility that observed changes in P.N.'s performance over time were due to test–retest fluctuations. In addition to matching the control subject on the usual parameters of age, sex, education and I.Q., we also required a subject who would be in the hospital during the 3-week test–retest interval, and who, like P.N., had some right-sided cortical damage. Because these criteria are stringent, and because the changes in P.N.'s performance on the experimental tasks were both selective and substantial, we used only one control subject. The subject was a 23-yr-old man with a 12th grade education who sustained damage to the right fronto-parietal areas when a compression gun he was operating at work was fired, and a nail penetrated his right cheek. His full-scale I.Q. was nearly identical to P.N.'s on both test occasions and, like P.N., his performance I.Q. showed some test–retest improvement (Table 1). The control subject's M.Q. was somewhat higher than P.N.'s, but increased by a similar amount from the first to the second test session.

Table 1. WAIS and WMS scores of P.N. and the control patient

	Session I		Session II	
	P.N.	Control	P.N.	Control
		WAIS		
Verbal I.Q.	99	102	98	102
Performance I.Q.	107	102	120	114
Full-Scale I.Q.	102	102	108	107
		WMS		
Information	3	4	5	6
Orientation	5	5	5	5
Mental control	8	8	8	9
Logical memory	6.5	11	13	8.5
Digits: Forward	5	5	4	5
Backward	4	5	4	4
Visual reproduction	13	13	13	14
Associate learning	8	9.5	13.5	17.5
M.Q.	82	93	100	106

EXPERIMENTAL METHOD

Design and materials

Semantic memory was investigated with the famous faces test from the Boston Retrograde Amnesia Battery [3]. The version of the famous faces test that we employed includes 48 faces representing people who became famous during one of the six decades from the 1920s to the 1970s. Eight famous faces from each of the six decades are included on the test. For present purposes we divided the famous faces test into two forms, Form A and Form B. Each form contained 24 faces, four from each of the past six decades. Corresponding to each face was a set of three semantic cues. In addition, we added a four-alternative forced-choice name recognition test for each face. The three distractor items were fictional names constructed to match the actual names on features such as length, number of syllables and type of surname.

Episodic memory was assessed with an autobiographical cueing procedure [11, 12]. Subjects in this task are presented with a common English word and asked to retrieve a specific personal memory related to it; they are also required to date the retrieved episode. In the present experiment, we examined the retrieval of episodic memories in

two conditions. In the *unconstrained* condition the patient was told that he should try to retrieve memories from any point in his life—minutes, hours, days, weeks, months or years ago. However, in the *constrained* condition, the patient was instructed to retrieve memories of events that occurred before a specified date. The temporal relation of this date to each testing session was determined by the time of onset of P.N.'s amnesia. Thus, when P.N. was tested in the first session, he was instructed in the constrained condition that he should try to retrieve memories from before the onset of the amnesia. When tested on the second occasion, he was also told in the constrained condition that he should retrieve memories from before the onset of the amnesia. Similar instructions were given to the control subject. On the first test occasion, the control subject in the constrained condition was told not to retrieve any memories from the past 4 days, and on the second session, he was told not to retrieve any memories from the past 3 weeks.

The patients were given 24 cues in each of the two sessions; the same cues were used in the constrained and unconstrained conditions of each session. The total of 48 cues that were employed in the study had been previously used and described by ROBINSON [12]. We randomly divided these cues into two sets of 24. Each set of 24 cues included eight affective cues (e.g. "happy" or "doubt"), eight activity cues (e.g. "throw" or "run"), and eight object cues (e.g. "box" or "milk"). The cues were randomly ordered on both Form A and Form B of the episodic-cueing task. Reaction time on this task was measured by a LaFayette Model 54519-A electronic timer that was activated and stopped by the experimenter.

Procedure

The famous faces test was administered first. After the procedure was explained, the patient was shown the first face and was given as much time as he needed to try to name it. If he indicated that he could not identify it, a set of semantic cues was provided. If the patient was still unable to supply the appropriate name, the four-alternative forced-choice recognition test was given. The same procedure was followed for each of the succeeding faces.

After a brief rest break, the episodic-cueing task was explained and administered. The unconstrained condition always preceded the constrained condition. The experimenter read the first cue word to the subject, and simultaneously activated the electronic timer. The experimenter stopped the timer when the subject indicated that he had retrieved an episodic memory. The subject then described the content of the memory to the experimenter, and attempted to date the memory by indicating how old he was at the time of the retrieved episode, by specifying the calendar date of the episode, or by indicating how long ago the incident occurred. However, if the patient could not retrieve an episodic memory to a particular cue within 60 sec, the trial was terminated and the patient was read the next cue. The same procedure was followed in the constrained cueing condition.

The same sequence of tests—famous faces, unconstrained episodic cueing, and constrained episodic cueing—was administered to both patients during the second session. At the end of the second session, the patients were asked to *redate* all of the episodic memories produced during the two test sessions, in order to check the reliability of the reported episodic memories. The experimenter read the contents of each memory to the patient, who in turn assigned a date to it.

RESULTS

Famous faces test

The data from the famous faces task were collapsed across the six decades represented on the test, since the number of observations was too small to permit meaningful evaluation of possible temporal trends in the data. In addition, the patients' score on this task was based on performance collapsed across the three subtests (uncued recall, cued recall, and recognition), again because of the small number of observations. The famous faces test yielded two important results. First, P.N.'s performance was nearly identical in the two test sessions. During the amnesic period P.N. either identified the pictures or recognized the names of 15 of the 24 faces; after the amnesia cleared, he was correct on 16 items. Second, the patterns of performance of P.N. and the control patient were also quite similar. The control patient, like P.N., was correct on about the same number of items on the first (20) and second (19) test sessions. Taken together, the foregoing data suggest that P.N.'s access to information in semantic memory was not impaired during the amnesic period.

Episodic cueing task

During the first session, P.N. failed to retrieve memories to two cues in the unconstrained condition and to seven cues in the constrained condition. During the second session, he

retrieved memories to all cues in the unconstrained condition, and failed in the presence of two cues in the constrained condition. The control subject failed to recall memories in the presence of two cues in the unconstrained condition of the first session, but retrieved memories to all cues in the other three conditions.

The data in Table 2 reflect the proportion of episodic memories that derived from before or after the "critical date" in the unconstrained conditions of the two test sessions. During the period in which he was amnesic, almost all of the memories retrieved by P.N. (0.86) dated from the 4 days between the onset of the amnesia and the test session. In contrast, when tested after the amnesic period, only a small proportion of P.N.'s memories (0.08) came from after the critical date. The control subject retrieved few memories from after the critical date in either the first (0.09) or second (0.04) sessions. These data indicate that there was a substantial change in P.N.'s retrieval of episodic memories during and after his amnesia.

Table 2. Proportions of memories deriving from before and after the critical date in the unconstrained condition of the episodic cueing task

		P.N.	Control
Session I	Before	0.14	0.91
	After	0.86	0.09
Session II	Before	0.92	0.96
	After	0.08	0.04

A similar pattern characterizes the data concerning the median age of retrieved memories in the *unconstrained* condition (Table 3). There is a striking difference between the ages of the memories reported by P.N. in the two test sessions: He retrieved memories of a much older median age after the amnesia had cleared (60 months) than during the amnesic episode (1.5 days). The control subject also showed a similar tendency, but the difference was much smaller. It is also interesting to note that P.N. generally retrieved older memories than the control in the second session. This effect may be partly accounted for by the fact that P.N. was acutely aware that he had retrieved mostly recent memories in the first session, and seemed to want to "prove" that he was capable of retrieving older memories.

The data concerning the dates of memories retrieved in the *constrained* cueing condition provide further information concerning P.N.'s episodic-memory function. During the amnesic episode, P.N. was in fact able to retrieve memories, to 17 of the 24 cues, that predated the onset of his amnesia. The median age of these memories was 12 months (Table 3). However, there was a striking and unusual temporal distribution of these memories: A large proportion of them (65%) derived from 1979, and concerned a job that P.N. held at the courier service mentioned earlier. P.N. was able to describe in detail many people, places and specific episodes pertaining to that job. All this took place at the same time that he remembered almost nothing about his personal past, including his name. He did know, as stated earlier, that he was called "Lumberjack" by the employees at the courier service. He retrieved six scattered memories from other periods of his life, most of which pertained to dramatic events of childhood, such as injuries and fights. However, P.N.'s job at the courier service, and the people and events related to it, seemed to constitute a relatively readily accessible "island" of episodic memory. No such "islands" were observed in P.N.'s second test session, or in either of the control subject's sessions.

Further insight into P.N.'s episodic-memory performance is provided by the retrieval

Table 3. Median age of memories recalled in the constrained and unconstrained conditions of the episodic cueing task

		P.N.	Control
Session I	Unconstrained	1.5 days	5 months
	Constrained	12 months	11 months
Session II	Unconstrained	60 months	10 months
	Constrained	72 months	36 months

latency data. All cases of retrieval failure to a given cue were assigned a latency of 60 sec. Table 4 presents the time to retrieve episodic memories in the constrained and unconstrained conditions of the two test sessions collapsed across the type of cue. Overall, P.N.'s retrieval latency substantially dropped from the first session (21.9 sec) to the second test session (11.1 sec); the reaction time of the control subject also dropped between sessions, but not by nearly as much. During his amnesia, P.N. was a great deal slower to retrieve episodic memories in the constrained condition (40.1 sec) than in the unconstrained condition (16.0 sec). However, the same pattern of data was observed in the post-amnesic session, and the control subject was also somewhat slower in the constrained cueing conditions. It is interesting to note that P.N.'s slow retrieval during the amnesic episode in the constrained condition can be largely attributed to frequent retrieval failures and slowness to retrieve memories outside the episodic "island" noted earlier. P.N.'s median retrieval latency for the six "non-island" memories was 33.7 sec; his median retrieval latency for the seven retrieval failures was, due to the above mentioned scoring criterion, 60 sec. However, the median time to retrieve the 11 memories included in the "island" defined by P.N.'s job at the courier service was only 13.4 sec. Although based on a small number of observations, these data suggest that P.N. had more ready access to episodes within the "island" than to other episodes.

Table 4. Median retrieval latencies in the constrained and unconstrained conditions of the episodic cueing task

		P.N.	Control
Session I	Unconstrained	16.0	9.9
	Constrained	40.1	13.8
	Overall	21.9	11.4
Session II	Unconstrained	8.3	7.1
	Constrained	15.6	10.3
	Overall	11.1	8.2

The data in Table 5 reflect the time to retrieve episodic memories to the three different types of cue—affective, activity, and object—collapsed across the constrained and unconstrained conditions; the data were collapsed because of the small number of observations to each type of cue in the constrained or unconstrained conditions alone. The performance of the control subject was similar to normal college students [12]: Retrieval to the affective cues was slightly slower than retrieval to object and activity cues. P.N., however, was a great deal slower retrieving memories to affective cues than to the other two types of cue in both test sessions. This finding, although suggestive of a way in which P.N.'s performance might differ from normals in the non-amnesic state, should be interpreted

cautiously for two reasons. First, the finding is based on a small number of observations. Second, P.N.'s slow retrieval to affective cues may have been related to the presence of anxiety and depression (as indicated by the MMPI) in the immediate post-amnesic period, rather than to a stable characteristic of his non-amnesic memory performance.

One of the difficulties in interpreting data from an episodic-cueing task such as the one we used is that the experimenter cannot directly check the validity of the memories produced by the subject. We attempted to assess the validity of memories produced in the episodic-cueing task by requiring both P.N. and the control subject to redate the memories produced during the two test sessions at the end of the second session. If a significant proportion of memories in this task had been fabricated, then the correlations between the original date and the redate should be smaller for the memories given in the first session than for those given in the second test session, since the subjects had three weeks to "forget" the responses produced in the first session, whereas they had only minutes to "forget" the responses from the second

Table 5. Median retrieval latencies to affective, activity, and object cues in the episodic cueing task*

		P.N.	Control
Session I	Affective	35.6	13.9
	Activity	22.5	12.7
	Object	18.8	8.8
Session II	Affective	22.9	10.2
	Activity	6.2	8.2
	Object	7.2	6.1

*The data are collapsed across the constrained and unconstrained conditions.

session. For P.N., the product-moment correlation between the two assigned dates was +0.92 for memories given in the first session, and +0.96 for memories produced in the second session. For the control subject, the corresponding numbers were +0.91 and +0.93. The direction and magnitude of these correlations are similar to those found with normal college students [12]. Thus, these data suggest rather strongly that the responses given in the cueing task were genuine episodic memories.

DISCUSSION

One of the important issues that must be dealt with in instances of functional retrograde amnesia concerns the genuineness of the case at hand. It is well known that a non-trivial proportion of cases that present with functional retrograde amnesia turn out to be deliberately simulated [13, 14]. There are several reasons why we wish to argue that the present case is indeed a genuine one. First, the descriptions of simulation and malingering in the literature do not fit the case of P.N. Simulated amnesias tend to run for weeks or months, whereas P.N.'s amnesia cleared within 4 days, a temporal duration that is characteristic of many other genuine cases [15]. In addition, in cases of feigned amnesia it is frequently found that the patient was attempting to escape financial difficulties or criminal prosecution [13, 14]; there were no such motives in P.N.'s case. Second, the sequence of stages observed in P.N.'s amnesia (fugue, followed by awareness of loss of personal identity and memory, culminating in sudden recovery with amnesia for the fugue period) closely corresponds to the

sequence observed in well-documented cases of genuine functional amnesia [7]. Third, the event that apparently precipitated the amnesia—the death of P.N.'s grandfather—was clearly a traumatic one for the patient, and provides an antecedent to the amnesia that makes good psychological sense in light of existing literature [5, 7]. For all of the foregoing reasons, we conclude that the case of patient P.N. constitutes a genuine instance of functional retrograde amnesia.

Before discussing several issues raised by our case study, it should be noted that we are well aware that data deriving from a single subject require interpretive caution. Thus, we do not attempt to offer firm conclusions or evaluate the adequacy of existing theories on the basis of our data. Rather, we emphasize the suggestive implications of our results for future studies of functional retrograde amnesia.

The data from the episodic task suggest that cueing procedures may constitute useful tools for the investigation of functional retrograde amnesia. Although clinical reports frequently suggest that functional retrograde amnesia is a global disorder, covering the patient's entire personal past (for exceptions, see SCHACTER and TULVING [5]), our cued-recall data indicate that this need not be the case. When, in the constrained condition, the experimenter insisted that P.N. attempt to retrieve memories antedating the onset of the amnesia, and provided specific retrieval cues as well as ample retrieval time, the patient came up with memories for about 70% of the cues, although most of these memories derived from the relatively intact "island" of episodic memories. Future studies of functional retrograde amnesia that explore the effectiveness of different kinds of retrieval cues may provide a basis for evaluating the generality of our findings.

Our data clearly demonstrate a dissociation between P.N.'s performance on the episodic cueing task and the famous faces task. How can we interpret this dissociation? The data are largely consistent with the hypothesis that functional retrograde amnesia entails a differential impairment of episodic and semantic memory. There are, however, some problems related to this description of the data. First, one can argue that the famous faces test taps *both* episodic memory and semantic memory: Subjects can use their knowledge of specific episodes in which a face was encountered to identify it on the test. We do not deny this possibility. But it does not logically follow that the famous faces test *requires* episodic memory for successful performance, nor does it follow that P.N. made use of episodic memory to identify the famous faces. However, we acknowledge that the famous faces test is probably not the ideal task for examining semantic memory, and we suggest that in future investigations a broader range of tasks is used to study semantic memory in cases of functional retrograde amnesia.

A second and related problem emerges from consideration of the kinds of information that P.N. was unable to recall during the period of his amnesia. In addition to his impaired retrieval of episodic memories antedating the onset of his amnesia, P.N. also could not recall many "facts" pertaining to his personal life. For instance, he did not know his name, and remembered nothing about his mother, father or grandfather. Thus, P.N.'s amnesia extended beyond the failure to recall discrete personal episodes, and included information that was not tied to unique spatio-temporal contexts. If P.N.'s amnesia entailed a selective impairment of episodic memory, why was he unable to recall non-episodic information of the sort mentioned above?

One speculative possibility is that "facts about oneself", such as knowledge of one's name and family members, are the *control elements* of episodic memory. Control elements may be viewed as hierarchically organized memory units that can activate or inhibit specific kinds of

information that are nested under them [16]. It may not be entirely implausible to hypothesize that access to specific autobiographical episodes depends upon the activation of the higher-order classes or categories of personally relevant knowledge that we have labelled control elements. It is possible to think of one's name as constituting the "ultimate control element" of episodic memory. Its activation may be a necessary condition of access to other mnemonic information that personal identity subsumes—past events, knowledge about family members, friends and the like. This idea receives some support from the fact that at the time of his admission to the hospital, P.N. identified himself as "Lumberjack"—a nickname that he had been given when he worked at the courier service. Thus, P.N. possessed a name that was related to the events of his "island". This name, we would hypothesize, served as a control element that permitted him to gain access to the events in the episodic "island". Although this hypothesis is a preliminary and tentative one, we do suggest that it merits further investigation.

It is possible, of course, that our characterization of P.N.'s amnesia as a differential impairment of episodic and semantic memory may not be the most appropriate way of describing the observed patterns of data. For example, one could also argue that P.N. had lost access to "personal" knowledge, including his name, family members, and specific autobiographical episodes, but was able to gain access to "non-personal knowledge", such as the names of the people represented on the famous faces test. However, the two distinctions—episodic/semantic and personal/non-personal—are closely related and difficult to distinguish between on the basis of data deriving from one patient. Studies that explore the usefulness of the two distinctions would be desirable.

Our data also have suggestive implications for the relation between functional and organic retrograde amnesia. One of the most consistently reported observations of organic retrograde amnesia is that it is *temporally* organized. Clinical investigators have claimed that retrieval of recently acquired memories is more severely impaired than retrieval of older memories [1, 2], and recent experimental studies have tended to confirm this observation, at least in some patient groups [3, 4]. In P. N.'s amnesia, recent memories did not seem to be less accessible than remote memories. P.N. was able to retrieve scattered episodic memories from a number of different times in his life, and retrieve many memories from the "island" that included events of about one year prior to testing. Although it is of course possible that a larger number of observations might have revealed a temporal pattern in the amnesia, it may be worth noting that none of the published clinical observations of functional retrograde amnesia have reported evidence of temporal organization.

One clue concerning the nature of organization of functional retrograde amnesia may be provided by considering the quality of the memories that constituted P.N.'s "island". These memories were characterized by the presence of considerable positive affect. P.N. described his job at the courier service in positive terms a number of times during his amnesia, noting that "I really liked that job" and "I enjoyed working there. It was a lot of fun". After the amnesia cleared, P.N. described his time at the courier service as one of the happiest periods in his life; he described most of his other experiences in either neutral or negative terms. These observations suggest that functional retrograde amnesia may be primarily organized along *affective*, rather than *temporal*, dimensions. Future studies of functional retrograde amnesia could focus on the affective characteristics of memories that amnesic subjects can and cannot retrieve. The results of such observations would then provide a basis for evaluating the validity and generality of our present impressions, and also help to understand the relation between affect and memory.

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Résumé

Le déficit mnésique d'un sujet présentant une amnésie rétrograde fonctionnelle a été évalué pendant et après l'épisode amnésique. Les performances du malade dans une tâche testant la mémoire sémantique ont été pratiquement identiques dans les deux sessions d'examen. Par contre, ses performances dans une tâche testant la mémoire des épisodes ont été substantiellement différentes d'une session à l'autre. Le fait de suggérer des indices a permis, en dépit de l'accès limité du malade à la mémoire des épisodes pendant la période amnésique, de mettre en évidence un "ilôt" de souvenirs relativement intacts. La distinction entre mémoire sémantique et mémoire des épisodes ainsi que les relations entre amnésies rétrogrades d'origine agnosique ou fonctionnelle, sont discutées à propos de cette étude d'un cas.

Zusammenfassung

Die Merkstörung eines Patienten, der eine funktionale retrograde Amnesie hatte, wurde während der amnestischen Episode und nach ihrer Beendigung untersucht. Die Leistung des Patienten bei einer Aufgabe, die das semantische Gedächtnis erfaßt, war nahezu identisch zu den beiden Zeitpunkten, aber seine Leistung bei einer Aufgabe, die das episodische Gedächtnis prüft, veränderte sich erheblich über die Testsitzungen. Bahnungshilfen zeigten, daß trotz des beschränkten Zugangs dieser Patienten zum episodischen Gedächtnis während der amnestischen Periode eine verhältnismäßig intakte Insel episodischer Erinnerungen aufgedeckt werden konnte. Die Unterscheidung zwischen episodischem und semantischem Gedächtnis wie die Beziehung zwischen organischer und funktioneller retrograder Amnesie werden anläßlich dieses Falles diskutiert.