

Recognition memory in psychotic patients

H. Ellis¹, K. De Pauw², G.N. Christodoulou³, J.-P. Luaute⁴,
E. Bidault⁴ and K. Szulecka⁵

¹*School of Psychology, University of Wales College of Cardiff, Cardiff CF1 3YG, UK*

²*Department of Psychiatry, Doncaster Royal Infirmary, UK*

³*Department of Psychiatry, Athens University Medical School, Greece*

⁴*Department of Psychiatry, General Hospital, Romans, France*

⁵*Department of Psychiatry, Bassetlaw District Hospital, UK*

Correspondence: H. Ellis at above address

Preliminary data are reported from experiments in which Warrington's (1984) Recognition Memory Tests were given to patients with misidentification delusions including the Capgras type and to psychotic patients. The results showed a profound impairment on face recognition for most groups, especially those with the Capgras delusion. It was rare to find a patient whose score on the word test was anything but normal.

INTRODUCTION

The following series of experiments was initiated as part of a more general cognitive neuropsychiatric approach to the study of delusional misidentification (DMI). However, since the results appeared to be of more general relevance to a wider study of schizophrenia and, perhaps, other psychotic illnesses, they are presented here in an unpolished form in order to stimulate debate.

Attempts to study psychoses using neuropsychological tests have long been attempted with varying degrees of success (Cutting, 1990). The fundamental assumption underlying such an approach is that psychotic illnesses are the result of impaired cortical and/or subcortical functioning; and that, at least for diagnostic purposes, they may be usefully explored by much the same techniques as those used for the diagnosis of unequivocally brain-injured patients.

Within the field of DMI there is a small tradition of examining patients with the Capgras, Fregoli and Intermetamorphosis delusions using standard neuropsychological tests as well as some tests specific for face recognition (Bidault *et al.*, 1986; Christodoulou, 1975, 1977; Kokkevi and Christodoulou, 1985; Morrison and Tarter, 1984; Shraberg and Weitzel, 1979; Syndodiou *et al.*, 1977).

Young *et al.* (1990) carried out a series of tests on patients diagnosed with the Fregoli or Intermetamorphosis delusions among which were tests of face and word recognition published by Warrington (1984). These tests require the patient to make affective judgments on 50 unfamiliar target faces and 50 words, each shown for a few seconds. There then follows an immediate recognition test in which

each of the targets is paired with another stimulus. The patient must indicate which of the two he or she recognises.

The results obtained with the Warrington Recognition Tests were interesting. The single Fregoli patient, a 66-year-old woman, with right temporal neurological signs, showed a clear and significant discrepancy in her performance of the two tests. Her recognition of words was very good (47/50) but her score on faces (36/50) was poor. Similar discrepancies were found for the three Intermetamorphosis patients, but these were statistically significant for only two of them.

Given the above results it seems that there is an interesting discrepancy between memory for words and faces by DMI patients which, if anything, is rather more pronounced than that found by Warrington (1984) for patients with right hemisphere lesions (see Table I). In the following studies this relationship was re-examined and extended by a series of tests with DMI and other psychotic patients from Greece, France and the UK. Since the testing was done consecutively and did not always involve exactly the same battery of tasks they will first be described separately before being considered together.

GREEK STUDY

The Warrington Face Recognition Test only was used. It was given to 16 schizophrenic patients with established histories of psychotic illness; of whom, four had been unequivocally diagnosed by one of us (GNC) as having

TABLE I. Summary of norms on the Warrington Recognition Memory Tests (1984)

	Words	Faces
Controls	45.0	43.5
All right hemisphere lesions	44.6	39.7
All left hemisphere lesions	39.9	41.8
Right temporal lesions	45.6	38.7
Left temporal lesions	38.2	41.2

TABLE II. Scores on the Warrington Recognition Memory Test for faces for Greek patients classified as Capgras' type, mixed-DMI and psychotic

	Sex	Age	Warrington RMT faces
Capgras' group	M	36	26**
	M	33	26**
	M	22	40
	F	64	29**
Median =			27.5
DMI group	M	34	26***
	F	29	39
	F	28	46
	F	49	37*
	M	60	20***
	M	24	43
Median =			38
Psychotic group	M	32	47
	M	32	50
	M	41	40
	M	23	44
	M	33	37*
	F	22	44
Median =			44

* = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$.

displayed the Capgras phenomenon; and six who had revealed some DMI signs that were less distinct. Table II gives details of these and the remaining six psychotic controls, together with their face recognition scores. Warrington (1984) gives age-related norms and standard deviations for her test and the statistical significance of each patient's departure from the norm is indicated. A summary of Warrington's norms is given in Table I.

The results indicate fairly strongly that the Capgras' group scored low on Warrington's Face Recognition Test. Some of the mixed-DMI cases also scored low but only one of the six psychotic controls performed significantly below the normal population. The Capgras and mixed-DMI group have median scores well below that found by Warrington (1984) for right hemisphere lesioned patients. These data support the suggestion that Capgras patients may be particularly disadvantaged in recognising unfamiliar faces. However, the Capgras phenomenon sometimes occurs not only for faces but also with reference to inani-

mate objects (e.g. Anderson, 1988). This suggests an overall deficit in cognitive efficiency and, of course, is so remarkably close to reduplicative paramnesia as to be indistinguishable from it (Pick, 1903; Cutting, 1990). In order to test this, recognition memory for stimuli other than faces was also tested in the following studies.

FRENCH STUDY

Warrington Recognition Tests

The full Warrington Recognition Memory Test (faces and words translated into French) was administered in counterbalanced order to four mixed-DMI patients, none of whom was diagnosed specifically as having the Capgras delusion but each of whom had shown some signs either of false recognition or of subjective doubles.

Each part of the Warrington Recognition Memory Test was administered in an order counterbalanced across patients. The word test was translated into French as closely as possible to the original. Of course, this translation may not have been a perfect one and the English norms therefore may not be entirely appropriate but, as is evident from Table III, the scores are high for three patients.

As is clear in Table III, for three of the patients with schizophrenia there was a clear impairment on the face recognition test coupled with slightly above average scores on the word recognition test. In the case of one patient, however, there is a remarkably low score (16) on the words test coupled with a score on the faces that is just within the normal range. It is difficult to interpret such a score which is dramatically lower than chance level (25).

Memory for houses

The sample of French psychiatric patients was also administered a test measuring their abilities to recognise visual material other than faces. The purpose of this was to establish whether their overall poor performance reflects a general problem with remembering objects; or, instead, is a manifestation of difficulties confined to face recognition.

A suitable test is in the process of being developed by Young and Hellawell at Durham University. It is based upon Warrington's paradigm but substituting pictures of houses for faces; and in its prototype form, there are 30 rather than 50 target stimuli. The four French patients were each individually asked to look at every house for about 3 sec and declare whether they thought them to be pleasant or not. At the end of the presentation series they were shown 30 pairs of houses and required to state which of the two had been previously shown.

The results of the house recognition test are summarised in Table IV. Three of the patients scored low compared with a sample of 20 controls aged between 22 and 53 years,

TABLE III. Scores on Warrington RMT faces and RMT words for four French schizophrenic patients

	Patient	Sex	Age	Warrington RMT faces	Warrington RMT words
Schizophrenic group	CC	F	35	34**	48
	AP	M	45	39	16***
	FD	F	52	34**	49
	CM	M	41	31***	49
			Median = 34.0	Median = 48.5	

* = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$.

TABLE IV. Scores (max = 30) on a test of recognition memory for houses

	Patient	House recognition test
Schizophrenic group	CC	21*
	AP	21*
	FD	25
	CM	27
		Median = 23.0

*More than 2.5 s.d.s below controls' mean.

TABLE V. Data on the Warrington Recognition Memory Tests for three British schizophrenic patients

Patient	Warrington Recognition Memory Tests			
	Age	Sex	Face	Words
CM	16	F	42	50
SO	19	M	32***	48
CJ	22	F	36*	47
			Median = 36.0	Median = 48.0

* = $p < 0.05$; *** = $p < 0.001$.

who averaged 26.35 (s.d. = 1.66). For two of the patients their score of 21 was significantly lower (i.e. more than 2.5 s.d.s) of the controls' mean score. It should be emphasised, however, that these results are preliminary. It may be, for example, that English architecture is sufficiently alien to produce a lower score for any French sample, psychotic or not.

BRITISH STUDY

Warrington Recognition Memory Tests

Warrington's Recognition Memory Tests for words and faces were administered to three young patients with schizophrenia one of whom (CM) had recently manifested transient signs of the Capgras delusion following ECT. Each patient completed both parts of Warrington's test, along with other tests not described here.

The data shown in Table V indicate that two of the patients scored significantly below average on the faces version of Warrington's Recognition Memory Test. However, the one patient (CM), who had earlier revealed

delusions that her parents, doctors and nurses had been substituted, scored in the normal range for her age. Despite the fact nonetheless she was rather better on the word test where she achieved a perfect score. Each of the other two patients also achieved high scores on the word test.

GENERAL DISCUSSION

The series of studies just described began with the idea that patients with DMI, particularly the Capgras type, may be particularly disadvantaged on a neuropsychological test. However, it soon became clear that psychotic patients with other delusions regarding people's appearance were also poor on the test. Moreover, other schizophrenics displayed comparable difficulties in remembering faces but showed none for words. The scores obtained for faces by patients were not only often significantly below that for age-matched controls (Warrington, 1984) but where equivalent or lower than the mean scores on the face recognition memory test found for patients with right hemisphere damage.

By extending the range of visual material to be remembered, it became apparent that the memory impairment may not be confined to faces. On a similar test of memory for houses three out of five patients tested scored significantly lower than a group of controls. The recognition memory difficulty of psychotic patients seems confined to visual-object stimuli where exemplars (faces or houses) are within-class. We cannot rule out the possibility that similar problems may be found if the stimuli are between class (a table, a chair, a telephone, a ball, etc.); but, given their normal scores for words and the ease with which such stimuli can be verbally encoded, it seems unlikely.

The data, in fact, are consistent with Cutting's (1990) recent theoretical analysis of schizophrenia and other psychoses. Following Kosslyn (1987), he maintains that the left hemisphere deals in categories and the right hemisphere handles within-category discriminations. He further postulates that schizophrenia is largely the result of right hemisphere dysfunction. The results presented above are entirely in accord with Cutting's position. That is not to say they prove his theory, however. There are many objections to the idea that the right hemisphere dysfunction is

exclusively involved in causing schizophrenia and other psychoses (Goldberg, 1990; Gray *et al.*, 1991) but the present data are grounds for further studies of the relationship between selective memory deficit and psychotic states. It should be noted that most of the patients tested had had a long-standing illness and were not currently experiencing delusions or hallucinations. The UK sample, however, were acute patients but this does not seem to have produced markedly different data from those obtained in Greece and France.

Acknowledgements

We should like to thank Professor A.W. Young and Ms D. Hellawell (Durham University) both for their help in conducting these experiments and for their valuable comments. The work is supported by a NATO collaborative Research Award.

REFERENCES

- Anderson, D.N. (1988). The delusion of inanimate doubles: implications for understanding the Capgras phenomenon. *British Journal of Psychiatry*, **153**, 694–699.
- Bidault, E., Luaute, J.P. and Tzavaras, A. (1986). Prosopagnosia and the delusional misidentification syndrome. *Bibliotheca Psychiatrica*, **164**, 80–91.
- Christodoulou, G.N. (1975). The syndrome of doubles. Associate Professorship Thesis, University of Athens, Athens.
- Christodoulou, G.N. (1977). The syndrome of Capgras. *British Journal of Psychiatry*, **130**, 556–564.
- Cutting, J. (1990). *The Right Cerebral Hemisphere and Psychiatric Disorders*. Oxford University Press, Oxford.
- Goldberg, E. (1991). Schizophrenia and stored memories: left hemisphere dysfunction after all? *Behavioral and Brain Sciences*, **14**, 30.
- Gray, J.A., Feldon, J., Rawlins, J.N.P., Hemsley, D.R. and Smith, A.D. (1991). The neuropsychology of schizophrenia. *Behavioral and Brain Sciences*, **14**, 1–84.
- Kokkevi, A. and Christodoulou, G.N. (1985). Psychometric investigation of patients with delusional misidentification syndromes. In *Psychiatry: The State of the Act* (Eds P. Pichot, P. Beenez, R. Wolf and K. Thau), pp. 841–849. Plenum Press, New York.
- Kosslyn, S.M. (1987). Seeing and imagining in the cerebral hemispheres. *Psychological Review*, **94**, 148–175.
- Morrison, R.L. and Tarter, R.E. (1984). Neuropsychological findings relating to Capgras syndrome. *Biological Psychiatry*, **19**, 1119–1128.
- Shraberg, D. and Weitzel, W.D. (1979). Prosopagnosia and the Capgras syndrome. *Journal of Clinical Psychiatry*, **40**, 313–316.
- Syndodiou, C., Christodoulou, G.N. and Tzavaras, A. (1977). Capgras' syndrome and prosopagnosia. *British Journal of Psychiatry*, **132**, 413–414.
- Warrington, E.K. (1984). *Recognition Memory Test*. NFER-Nelson, Windsor.
- Young, A.W., Ellis, H.D., Szulecka, K. and de Pauw, K.W. (1990). Face processing impairments and delusional misidentification. *Behavioural Neurology*, **3**, 153–168.



Hindawi
Submit your manuscripts at
<http://www.hindawi.com>

