Delusional Misidentification Incident in a Right Hemisphere Stroke Patient

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We report a delusional misidentification incident lasting some hours in which a man who had suffered a right hemisphere stroke, HW, mistook a student for his daughter. Investigation of HW's face processing abilities showed unimpaired ability to recognize familiar faces and match facial expressions, but severe impairments of unfamiliar face matching both on the Benton test and a task requiring the matching of disguised and undisguised faces. The incident shows some similarity to the Frégoli delusion, which has also been noted following brain injury affecting the right cerebral hemisphere.

Introduction

There is increasing evidence of organic involvement in delusional misidentification (Joseph, 1986). Brain injuries have been demonstrated in all of the major delusional misidentification syndromes: Capgras' delusion, in which certain people are felt to have been replaced by "dummies" or imposters, the Frégoli delusion, in which a cunningly disguised persecutor is claimed to be following the patient about, and intermetamorphosis, in which a particular person's appearance seems to the patient to transform into that of someone else (e.g. de Pauw *et al.*, 1987; Joseph, 1987; Lewis, 1987).

Investigations of the face processing abilities of DMS patients have provided some evidence of impairment. For example, Capgras' patients are often poor at unfamiliar face matching tasks (Luaute *et al.*, 1978; Shraberg and Weitzel, 1979; Morrison and Tarter, 1984; Tzavaras *et al.*, 1986). However, the interpretation of these findings is limited by the fact that problems in unfamiliar face matching are only one of a number of dissociable face processing impairments which can be observed after brain injury. In particular, dissociable impairments of familiar face recognition, unfamiliar face matching, and recognition of emotional facial expressions have been described (for reviews, see Bruce and Young, 1986; Young and Bruce, 1991). To date, only one investigation of face processing impairments in delusional misidentification patients has made use of tasks which can tap each of these dissociable abilities (Young *et al.*, 1990).

In the present paper, we describe a form of delusional misidentification which occurred in a patient who had suffered a right hemisphere stroke, and report his performance on face processing tasks identical or similar to those

previously used in the investigation of delusional misidentification by Young *et al.* (1990).

Case Description

HW, a right handed man aged 67, had suffered a right hemisphere stroke. On admission to hospital, he showed left hemiplegia, but was conscious and did not have any speech defect. In the weeks prior to the stroke he had suffered a number of episodes involving clumsiness and weakness of the left hand, and “personality changes” (mood). These were thought to reflect transient ischaemic attacks.

HW was discharged from hospital 2 weeks later, after showing some improvement with physiotherapy. However, he showed persistent left-sided neglect, and was referred to us some 6 months later for this reason. A student given the task of investigating his visuospatial neglect visited him a few times during a 2-month period, and noted neglect in cancellation and drawing tasks (Albert, 1973; Heilman, 1979), but no evidence of neglect in reading text or single words. There was still some left-sided motor weakness, but no evidence of a left visual field defect on confrontation testing.

Misidentification Incident

During one of the student’s visits to HW, an extraordinary incident occurred. When she arrived at his house, he was waiting for her at the door as she drove up, and remarked that for a minute he had thought she was someone else. A few minutes later, he asked “Where did you have your hair done? Was it someone at school?”

The student’s attempts to explain to HW that this was her natural hair colour met with the response that “it was blonde this morning”. Gradually, it became clear that he was under the impression the student was his daughter. Despite protesting her real identity, she was given the jobs of helping to retrieve an electric fire from the loft, replacing a light bulb, making tea, and even cutting his fingernails.

Trying to convince HW that she was not his daughter only made matters worse for the student, since he became increasingly irritated by the “deception” he thought his daughter was attempting in claiming to be our student. He was cross that she had “stolen” someone else’s library card and bank statement, and confiscated them to return to their proper owner. Returning to the topic of the hair colour, he drew attention to photographs of his daughter and said “Look, I told you your hair was blonde this morning. You can’t fool me, there are too many pictures of you [up] in here”. When asked to do the tests she had brought, HW replied “Not now love, I want to watch the television. Stop bothering me”. After further persuasion, he carried out some tasks, but then announced that “You know, you’re quite good at this. Well, you’re at least as good as J . . . [the student]. You should do something like this when you leave school”. This led to a

harangue about truancy, and that her “mum” would have to talk to her when she got home from work.

After more than 3 hours, during the whole of which HW consistently maintained that she was his daughter, the student managed to persuade him to allow her to go, though he was reluctant to let her leave by car, since “you haven’t passed your test yet”.

The student rang HW’s wife the next day, to clear up any further ramifications. His wife confirmed that when she got home from school her daughter had indeed been accused of lying, stealing someone else’s identification, playing truant, and driving a blue car before she had passed her test. To the best of her knowledge, HW had never done anything like this before.

Two weeks later, the student visited HW accompanied by one of the authors. He remembered the incident, and was able to describe it in detail. Although he did not this time accuse the student of being his daughter, he seemed to retain some suspicion about the matter, and was not in the least apologetic. The opportunity was taken to carry out tests of HW’s face processing abilities.

Face Processing Abilities

Tests were given to assess HW’s ability to identify familiar faces, to match unfamiliar faces, and to determine facial expression. The results are summarized in Table 1.

Identification of familiar faces

HW was shown 20 highly familiar faces, 20 moderately familiar, and 20 unfamiliar faces, presented one at a time in random order. For each face he was asked whether or not it was a familiar person and, if so, his or her occupation and name. Control data were taken from 28 men of comparable age (65–75 years) from a series of normal men tested at the Radcliffe Infirmary, Oxford (de Haan *et al.*, 1991). The task has previously been used in the investigation of delusional misidentification by Young *et al.* (1990). The data of interest concern ability to give correct occupations and names to the 20 highly familiar faces, and the rate at which the 20 unfamiliar faces were misidentified. Data for the moderately familiar faces are not included in Table 1, because the control subjects showed high variance in their responses to these.

Results showed normal ability to identify familiar faces for HW. He scored as well as controls for both occupations and names of highly familiar people, and showed no tendency to misidentify any of the unfamiliar people (20/20 correct rejections).

Unfamiliar face matching

Two tests of unfamiliar face matching were used, as in Young *et al.*’s (1990) previous investigation of delusional misidentification.

TABLE 1. *HW's performance of face processing tasks, and means and standard deviations for control subjects of comparable age*

	<i>HW</i>	<i>Controls</i>	
		<i>Mean</i>	<i>SD</i>
<i>Identification of familiar faces</i>			
High familiarity faces			
Occupation:	19/20	18.86	1.15
Name:	17/20	16.25	2.81
Unfamiliar faces			
Correct rejections:	20/20		
<i>Unfamiliar face matching</i>			
Benton test:	35/54*	44.22	3.07
“Disguise” task:	11/24**	22.30	2.16
<i>Facial expressions</i>			
Matching:	30/32	29.79	1.67

* = more than 2.5 SDs below control mean

** = more than 4.0 SDs below control mean

First, the Benton Test of Facial Recognition (Benton *et al.*, 1983). In this test, subjects have to choose which of six photographs of unfamiliar faces are pictures of the same person as a simultaneously presented target face photograph. The test includes items involving choice of identical photographs and transformations of orientation or lighting, which are pooled into an overall composite score.

HW was very slow and hesitant on the Benton test. His overall score (35/54 correct) was impaired both in terms of the test's norms and in comparison to a group of 32 men of comparable age tested at the Radcliffe Infirmary (see Table 1). The breakdown of his scores on the subparts of the test was 6/6 correct for identical matches, 11/24 for orientation transformations, and 14/24 with transformed lighting. The accurate performance with identical matches is important, because it shows that HW's poor overall performance was not simply a consequence of failure to attend to faces on the left of the test display because of his unilateral neglect. Appropriate cues were given when necessary, to make sure that HW examined each of the faces in the display, and his accurate performance at matching identical faces shows that this was effective. The poor overall performance thus reflects a genuine deficit on the unfamiliar face matching task.

The second unfamiliar face matching test examined ability to match disguised faces. Two separate test sheets were used, each showing a 3 × 4 matrix of faces in which each of the four faces in the top row appeared three times in disguised or undisguised forms elsewhere on the sheet (see Young *et al.*, 1990, for an illustration). HW was severely impaired at matching these faces (11/24 correct) in comparison to the 10 controls of comparable age (range, 63–75 years) from Young *et al.*'s (1990) study.

Facial expressions

HW was shown pairs of photographs of faces of two different people (presented simultaneously), and asked to decide whether or not they had same or different facial expressions. Sixteen of the pairs had the same expressions, and 16 different expressions. HW's performance (30/32 correct) was unimpaired in comparison with that of 34 men of comparable age from the Radcliffe Infirmary series.

Discussion

HW maintained that our student was his daughter, and continued to act in accordance with this belief for several hours, despite disconfirmatory evidence. The incident bears some resemblance to the Frégoli delusion, in which a persecutor is claimed to have adopted a cunning disguise. The parallel lies in the claim that a seen person is actually someone other than they might appear to be. However, it is not an exact parallel. Although HW maintained that his "daughter" had changed her hair colour, he did not directly imply that she had done this in order to trick him, and he did not seem to feel that she was trying to persecute him or surreptitiously observe him. The only way in which he thought his "daughter" was trying to deceive him was in pretending to be someone else (i.e. our student), which he seemed to consider a joke taken much too far, and he did not suggest that she had made any change to her appearance other than the hair colour. Indeed, the "deception" was initially revealed only because the student insisted she was not HW's daughter. Had she not done this, we can only presume that he would have accepted her as his daughter whilst the incident lasted.

Although not exact, then, the parallel with the Frégoli delusion is interesting because the Frégoli delusion has also been found to occur in the context of a right hemisphere lesion (de Pauw *et al.*, 1987). We cannot of course be certain that his right hemisphere stroke played a direct causal role in the production of this incident for HW, but it is noteworthy that he had experienced TIAs, and that he had not previously suffered from delusional misidentification. The possibility that the incident was related to the stroke itself or a further TIA must thus be seriously considered.

Investigation of HW's face processing abilities showed unimpaired ability to recognize familiar faces and match facial expressions, but severe impairments of unfamiliar face matching both on the Benton test and our "disguise" task. In GC, a case of Frégoli delusion following cerebral infarction we were able to investigate, there was also a severe impairment on the "disguise" matching task and no impairment of expression processing (Young *et al.*, 1990). GC and HW differed, however, in that GC showed some impairment in our test of identification of familiar faces whereas HW was quite normal at this, and in that HW was impaired on the Benton test, which GC performed normally.

Ellis and Young (1990) drew attention to the similarity between the Frégoli delusion and an error all of us make from time to time in everyday

life. When we expect to meet a particular person, we will occasionally misidentify someone else as that person (Young *et al.*, 1985). However, we usually quickly correct this mistake when inconsistent evidence is picked up (typically, by getting a better view of the person in question). Even so, there are rare occasions when we have to apologize after greeting a stranger. In Frégoli cases, and for HW, though, inconsistent evidence proves insufficient to alter the misidentification. As Ellis and Young (1990) emphasize, this must involve impaired decision mechanisms, which means it may well be more than a coincidence that both GC and HW were poor at disentangling the effects of disguise.

In making this point, we do not seek to claim that the face processing impairments observed in such cases are in themselves *sufficient* to cause the delusions. This seems most unlikely, given that face processing impairments are quite a common consequence of right cerebral injury (Ellis, 1983; Benton, 1990), and hence many patients with impaired face processing abilities do not seem to suffer delusional misidentification.

Instead, the face processing impairments may play a role in allowing the delusions to take such a strong hold, since they will make it harder to arrive at contradictory evidence, especially when impaired decision mechanisms are involved (Young *et al.*, 1990). In addition, an intriguing possibility is that delusional misidentification reflects particular *combinations* of impairments (e.g. Lewis, 1987), as has been argued for the related problem of reduplicative paramnesia (Kapur *et al.*, 1988). On this view, HW's case could involve some but not all of the components that contribute to the full-blown Frégoli delusion.

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