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Delusional Misidentification and Dangerousness: A Neurobiologic Hypothesis

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ABSTRACT: Delusional misidentification syndromes have intrigued this century's psychiatric researchers. More recently, the dangerousness posed by individuals suffering from these syndromes has been a subject of scientific inquiry. A series of five individuals suffering from delusional misidentification syndromes was studied from a phenomenologic and neuropsychologic perspective. Using this information, a hypothesis involving the psychobiological contributions to the dangerousness of delusional misidentification can be generated. This may further our understanding of the dangerousness posed by psychotic individuals.

KEYWORDS: forensic psychiatry, dangerousness, mental disorder, schizophrenia, delusional misidentification syndromes, face recognition

Ever since Capgras and Reboul-Lachaux's seminal report of the delusion of doubles in 1923 [1], delusional misidentification syndromes have stimulated this century's psychiatric researchers. From a forensic-psychiatric perspective, these syndromes have been a focus of scientific inquiry as a significant number of persons suffering from these syndromes have physically harmed others [2-6].

Delusional misidentification syndromes are characterized by a delusion in which the physical and/or psychological identities of the self or others are radically changed [7]. The most common of these syndromes is Capgras syndrome in which a person delusionally believes in the existence of physical duplicates of another. In Capgras syndrome, the psychological identity of the imputed impostor is thought to be different than the original identity while the physical appearance of the psychologically misidentified person remains unchanged [1,7,8]. Several other types of delusional misidentification syndromes have been documented and are described later in the discussion section [5,9,10].

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There remains controversy as to whether delusional misidentification phenomena are syndromes, discrete diagnostic entities, or only symptoms of other mental disorders [5]. However, for purposes of assessing dangerousness, in this paper we consider delusional misidentification phenomena as comprising syndromes, in line with most of the psychiatric literature [11,12].

While the initial research emphasis in the study of delusional misidentification syndromes focused on phenomenological and psychological aspects of these syndromes, in recent years, they have been largely studied from a biological perspective. Organic factors have been frequently associated with these syndromes [13–15]. In particular, persons with delusional misidentification syndromes may display neuropsychologic deficits, such as facial processing impairments and other visual cognition abnormalities. Such neuropsychologic findings may have neurobiologic significance [16–18].

In this article, we present five cases in which delusional misidentification was associated with dangerous behaviors. All five patients were evaluated for facial recognition deficits. All patients were administered the Benton Facial Recognition Test (BFRT) [19] and the Warrington Recognition Memory Test (WRMT) [20]. DSM-III-R criteria were used for psychiatric diagnoses [21]. We then address the possible role of face processing in the psychobiology of delusional misidentification syndromes in the assessment of dangerousness.

Case 1

Mr. A is a 42-year-old man who was psychiatrically hospitalized after he verbally threatened his mother. The patient expressed uncertainty that his mother was his real mother. Mr. A also reported experiencing auditory hallucinations.

Mr. A's psychiatric history dates back to age 21. Eight years prior to the current hospitalization, he had struck his mother believing that he was hitting her physical double who intended to kill him. The patient had entertained his belief in his mother's double for about one month before assaulting her. Mr. A believed at that time that the impostor mother had a different mind than his true mother and that as she had begun to change, she would appear strange, and "not act herself." He denied that the fraudulent mother had even minor differences in physical appearance from his true mother. A year prior to admission Mr. A had also thought that he was General Patton for two months, but did not notice any changes in his own physical appearance at that time.

His physical examination, complete blood count (CBC), and routine chemistry panel were normal. Mr. A was treated with neuroleptic medication with resolution of his psychotic symptoms in three weeks.

Case 2

Mr. B is a 42-year-old man who was psychiatrically hospitalized after threatening to cut a 7-year-old boy with a knife. Mr. B believed himself to be Jesus Christ. He denied any misidentification delusion involving the 7-year-old. He further reported that the skin of his body and face would change frequently and over a period of several minutes would change back and forth from normal human skin to a scaly, snakelike texture. His skin would also change color. He feared that supernatural forces, or perhaps members of his family whom he mistrusted, were responsible for these changes.

On other occasions, the patient has entertained beliefs that his parents, three brothers, one sister, one niece, two female acquaintances, and the town sheriff had undergone physical and psychological changes terminating in different identities from those of the originals. He also reported to have seen skin changes in these persons similar to those he would witness on himself. In the past, he had attacked two of his misidentified brothers believing that they intended to attack him. He also reported having had desires to harm

his mother at the time he was misidentifying her. The patient also complained of auditory hallucinations and intermittently experienced suicidal ideation.

Mr. B denied any history of head injuries, seizures or major medical illness. He gave no family history of mental illness. His physical examination was unremarkable. His CBC and routine chemistry panel were normal. He was treated with neuroleptic medication, and his paranoia, misidentification delusions, and aggressive ideation disappeared after one month.

Case 3

Mr. C is a 27-year-old man who was hospitalized for agitation and aggressive behavior towards his mother. He also believed that he was the biblical archangel Michael and possessed great religious powers. He mistrusted the other inpatients because they had the minds of the devil. He perceived the misidentified patients as having changed because their foreheads had semitransparent horns. The patient did not misidentify his mother or hospital staff.

Mr. C manifested labile mood, auditory hallucinations, decreased need for sleep, pressured speech, and intermittent flight of ideas. He required seclusion and restraints after becoming combative. At that time, he accused the other patients of being devils and as the archangel Michael he ordered the psychiatric staff to leave the ward.

The patient has no history of head injuries, seizures, or other major medical illness. While he had no criminal history, he was frequently brought to the psychiatric hospital for threatening and agitated behavior. There was no family history of psychiatric illness. His physical examination, CBC, and routine chemistry panel were within normal limits. His agitation, irritability, hostility, and pressured speech subsided with neuroleptic medication and lithium carbonate. Though he no longer perceived facial changes in other patients, he continued to believe that some of them were devils and that he was the archangel Michael.

Case 4

Mr. D is a 41-year-old man who was psychiatrically hospitalized for paranoia and generalized homicidal ideation. He believed himself to be Jesus Christ. He denied any radical physical changes in his body. The patient also believed that there were physical doubles of Bo Derek, Raquel Welch, and Michael Jackson, who had different minds than those of the originals. He believed that others did not respect him as the Messiah. On several occasions direct intervention by hospital staff was needed when his delusional thinking resulted in verbal threats that quickly escalated to physically threatening postures. He has a history of being in jail for two months for assaulting a relative whom he did not misidentify. Mr. D also complained of auditory hallucinations.

Mr. D had no history of head injury, seizures, or other major medical illnesses. He has a cousin who is known to suffer from a psychotic disorder. His physical examination, CBC, and routine chemistry panel were unremarkable. He was treated with neuroleptic medication and after two weeks, his hallucinations, aggression, agitation, paranoia, grandiosity, and misidentification delusions disappeared.

Case 5

Mr. E is a 38-year-old man who was admitted to a locked psychiatric unit complaining of transistors in his head that threatened to transform his mind into that of a woman. He also experienced desires of harming others. He harbored paranoia toward the ward psychiatrist, his mother, and his brother. He perceived his psychiatrist and other hospital

staff as appearing unreal. He believed that his mother, brother, and Pope John Paul II had been replaced by physically identical doubles. However, the impostors had different minds than those of the originals. He also believed that there were several physical clones of his body who nevertheless harbored minds different than his own. Mr. E was very verbally threatening toward the "double" of his brother as well as expressing a wish to harm the "double" of his mother. Mr. E complained of seeing his tattoos move and also experienced the world as being different like being "inside a brain." He also experienced auditory hallucinations.

Mr. E had no history of head injury, seizures, or major medical problems. His physical examination, CBC, and routine chemistry panel were unremarkable. He gave no family history of mental disorders. His delusions of misidentification, paranoia, aggression, and depersonalization abated after one month of treatment with neuroleptic medication.

Discussion

Phenomenology of Delusional Misidentification

Our five patients displayed a variety of delusional misidentification syndromes. We specify from which delusional misidentification syndrome each patient suffers. We do not, however, provide a detailed phenomenologic discussion as this can be found elsewhere in the psychiatric literature [7]. Data on the results of face processing tests, diagnosis, depersonalization, and derealization are provided in Table 1.

During his current hospitalization, Mr. A suffered from Capgras syndrome as he believed that his mother was a physical duplicate of his actual mother [1,8]. His past history of psychological misidentification of the self is consistent with the "reverse" Capgras syndrome [7,9].

Mr. B had suffered from the syndrome of intermetamorphosis as he expressed having had delusions of physical and psychological misidentification in others [22,23]. He also suffered from "reverse" intermetamorphosis, as a result of his current delusion of physical and psychological changes in himself [7,24].

Mr. C suffered from the syndrome of intermetamorphosis as he delusionally believed that the physical appearance of others changed as horns grew on their foreheads as well as thinking of their psychological identity changing into that of the devil. Mr. C's delusion that his mind was that of archangel Michael, without any reported bodily change, indicated the presence of "reverse" Capgras syndrome [7,9].

Mr. D suffered from Capgras syndrome as he harbored the delusion that several film stars, had physical duplicates who had different minds than the originals. He also suffered from "reverse" Capgras syndrome as he delusionally believed that he harbored the psychological identity of Jesus Christ without changes in his own physical appearance.

TABLE 1—*Diagnostic, neuropsychologic and phenomenologic findings.*

Case no.	Dx	BFRT	WRMT	Depersonalization	Derealization
1	1	30	26	No	Yes
2	1	36	42	Yes	Yes
3	2	42	44	No	Yes
4	1	38	38	No	Yes
5	1	45	34	Yes	Yes

Dx = Diagnosis (1 = schizophrenia, paranoid type; 2 = schizoaffective disorder).

BFRT = Benton Facial Recognition Test score.

WRMT = Warrington Recognition Memory Test, face recognition subset score.

Mr. E suffered from Capgras syndrome as he delusionally believed that physical impostors of his mother, his brother and the Pope existed. In addition, he suffered from the syndrome of subjective doubles (Capgras type) as he believed that several physical lookalikes of himself existed with such impostors having different minds than his own [25].

Cases 3, 4, and 5 illustrate the well-known finding that several misidentification syndromes can co-occur within the same episode of delusional misidentification [23]. Furthermore, an individual may misidentify multiple human objects within one single episode of misidentification (Cases 2, 3, 4, 5) [23,24]. The co-occurrence of misidentification syndromes within an episode of misidentification and the unitary idea of misidentification which pervades these phenomena suggests that the phenomenologically distinct misidentification syndromes may have a common etiology [10,26].

Psychodynamics of Delusional Misidentification and Dangerousness

Although considerable research findings have been generated, the accurate assessment of dangerousness has been elusive [27]. Nevertheless, the presence of delusional misidentification may heighten an individual's potential for acting aggressively. Such individuals tend to view their misidentified victim not only with mistrust, but also as inauthentic and thus justifying the attack by the delusional individual. The delusion can be a way of coping with otherwise unacceptable aggression. Unacceptable parts of the self may be projected onto the misidentified person utilizing primitive ego defense mechanisms such as projective identification [3,28]. Serious physical injury has been enacted by persons suffering from delusional misidentification syndromes. For example, such aggressive patients have acted violently by swinging a meat cleaver or using a knife causing serious injury to the misidentified person [23,29]. Completed homicides are uncommon, but certainly not rare [2,3,6,30].

Patients with delusional misidentifications may manifest their aggression by threatening or physically attacking the misidentified object as exemplified by cases, 1, 2, and 5 [5]. However, many of these patients become dangerous because they misidentify themselves leading them to believe they are omnipotent and worthy of much attention. When their demands are not met, they may react by threatening or attacking others [5]. Cases 2, 3, and 4 are illustrative of this latter type of individuals. Most patients who suffer from delusional misidentification are also suspicious of their misidentified objects [11]. In addition, most of these patients misidentify people who have important affective meaning toward them. Therefore, many of the people who become the victims of individuals who suffer from misidentification syndromes are family, friends, or acquaintances of the affected individual [3,5]. However, some of the victims may be strangers to the patient. Nevertheless, the patient may have an affective connection to them especially if they are viewed as important people such as would be the case for prominent figures like entertainment industry stars or politicians [5,28].

On rare occasions, individuals who suffer from misidentification delusions may be able to convince others such as other family members to act on their dangerous misidentification delusions. For example, in 1889, Woods reported the case of a family who was convinced that one of the children was a "changeling." They were able to convince themselves that the child who was thought to be the "devil" or a "bad fairy" should be killed. The boy died of severe physical trauma [31]. In a recent study, Perr and Federoff discussed the case of Louis Riel, a man who at one point in his life misidentified himself as a religious figure. Although he later experienced some improvement in his mental condition, he retained some misidentification ideas and later led an insurrection in Canada, which in turn led to the deaths of others. His case illustrates that under some

conditions, individuals who have been affected by delusional misidentification phenomena, can influence the course of political circumstances including events of historical magnitude, which may lead to the harm and even deaths of others [32]. As Perr states, “. . . the fact that such a severely ill person could mold a people is distressing, and one can only hope that in a world approaching the 21st century, knowledgeable and educated people will not subject themselves to modern-day charismatic Messiahs (p. 583)” [33].

Studies of delusional misidentification and dangerousness have only been done retrospectively [3,6]. From this vantage point the psychodynamics of the dangerousness behavior may be reconstructed. Other factors besides the psychology and phenomenology of delusional misidentification need to be examined to allow more accurate assessment of dangerousness in individuals suffering from delusional misidentification syndromes on a prospective basis. An examination of neurobiologic factors may hold a partial answer.

Neurobiological Aspects of Delusional Misidentification and Dangerousness

Organic factors have been implicated in the etiology of delusional misidentification syndromes [9,14,34–38]. In particular, delusional misidentification syndromes have been associated with both nondominant hemispheric dysfunction [35] and dominant hemispheric abnormalities [38]. This suggests that both left and right brain mechanisms operate in the genesis of these syndromes [13,14,39,40].

The authors of the previously mentioned studies have searched for organic markers that can be readily detected by biological techniques such as neuroimaging or electroencephalography. However, many studies encompassing cases of delusional misidentification have not detected any neurologic factors. Neuropsychological testing may yet yield positive findings in such cases. In this study we focus on two measures of face processing although we emphasize that other measures of brain function are likely to be involved in the genesis of delusional misidentification syndromes [18].

Results of face processing function for our five subjects are listed in Table 1. Face processing abilities have been associated with non-dominant cerebral structures [41,42]. In addition, deficits in facial processing have been associated with delusional misidentification syndromes [16,17,43,44] consistent with previous suggestions that right hemisphere dysfunction is implicated in generating delusional misidentification syndromes [35,45]. Although we have no direct evidence that our five patients had any gross neurological insults, the available information suggests that our four patients suffering from schizophrenia were experiencing mild difficulties with facial recognition based on their scores on the WRMT for faces. Poor performances on this subtest have been associated with nondominant hemispheric pathology [20]. In addition, three of these 4 patients (Cases 1, 2, and 4) also displayed BFRT scores suggestive of non-dominant brain deficits. Low BFRT scores may also be indicative of right brain pathology [19]. The WRMT has a memory component to it whereas the BFRT only involves immediate matching a face to other faces. Three patients (Cases 1, 4, and 5) scored below the 5th percentile and one patient (Case 2) scored below the 20th percentile of normal samples in the WRMT for faces [20]. It is therefore possible that some misidentification syndromes not only have fairly pervasive difficulties with early stages of face identification processing associated with immediate matching, but also with the storage of engrams involved in face processing. If this is true, then we predict that these patients may produce abnormal WRMT-facial component as well as abnormal BFRT scores. In another subtype of misidentification syndromes, encoding of structures necessary for early facial processing may be intact but later stage processing requiring memory stage may not. If this is true, then some patients with misidentification syndromes may show unremarkable BFRT scores, but abnormal WRMT facial component as exemplified as Case 5.

We suggest that many but not all misidentification syndrome patients will report clear subjective abnormalities in face processing. We think that this may be true because not all mechanisms involved in face processing need to be conscious [46,47]. In our series, only patients in Cases 2 and 4 reported perception of clear face processing abnormalities. In the other three cases, the patients reported feelings of strangeness, derealization or depersonalization involving the faces of the self or of others, suggestive that abnormalities in face perception may be experienced by subjective processes which are not clearly conscious [48,49].

Four of our patients suffered from paranoid schizophrenia. The patient in Case 3, who suffered from schizoaffective disorder, is interesting because he reported facial distortions in others but the BFRT and the memory recognition for faces showed no suggestion of deficits. This finding indicates that not all subjective reporting of radical facial distortion may be associated with the factors which the BFRT or WRMT identify. It is also possible that schizoaffective disorder and perhaps bipolar disorder patients develop misidentification delusions and facial recognition deficits with different neurobiologic substrates from those of schizophrenic patients.

From a forensic psychiatric perspective, it does appear that psychotic beliefs involving radical facial changes in the self or others lead patients to become either more grandiose and/or paranoid. Delusional misidentification patients may experience facial changes in themselves leading them to conclude that others may be causing the unwanted changes on themselves such as in Case 2. They may also welcome such changes reinforcing grandiose ideas about themselves. Alternatively, they may see the facial changes in others and become fearful that the alleged new identities may attack them. For example, delusional misidentification patients may think that others may be transforming into beings who may want to harm the patient [5,23,28]. Therefore, in evaluating dangerousness in patients suffering from misidentification syndromes, it is important to evaluate not only the details of the misidentification delusions but also perceptual phenomena such as frank reports of facial changes accompanied by facial distortion, facial color or texture because such changes may reinforce the misidentification delusion, increasing the degree of dangerousness to others.

Symptoms of depersonalization or derealization may be associated with temporal lobe and limbic system activity and dysfunction [50,51]. Delusional misidentification syndromes are frequently associated with these symptoms [52]. In our series, all five patients experienced derealization and the patients in Cases 2 and 5 also reported depersonalization. Subtle symptoms such as depersonalization or derealization may also be associated with conscious or unconscious beliefs of facial changes, and other misidentification phenomena. In psychotic patients suffering from depersonalization or derealization, misidentification delusions should also be ruled out. It is important to determine the meaning which depersonalization and derealization phenomena may have for the specific patient. A patient, for example, may perceive a face of another as appearing strange leading the patient to confirm the patient's suspicions that the other is a devil who intends to harm the patient. In our series (see Table 1), all five patients experienced derealization towards others, a factor that appeared to make them more suspicious of the authenticity of the misidentified others. The patient in Case 2 experienced depersonalization and believed that others were possibly responsible for his uncomfortable symptom.

Our study is preliminary and limited to phenomenologic characterization and focused neuropsychological testing (face processing). In the future, however, studies of delusional misidentification and dangerousness should include not only accurate phenomenology of the delusions, but also phenomenology of perceptual disturbances and the more ambiguous phenomenology of derealization and depersonalization. Such studies of dangerous misidentification delusions could further benefit from a wider array of neuropsychologic

tests that assesses both dominant and non-dominant hemispheric function. Integration of the phenomenology and metapsychology of delusional misidentification with neurobiological probes that include brain neuroimaging, computerized electroencephalography, and neuropsychologic testing, could increase not only our understanding, but accuracy of assessing dangerousness in delusional persons.

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