Journal of Health and Medical Sciences

Volkan, Kevin. (2020), Delusional Misidentification Syndromes: Psychopathology and Culture. In: *Journal of Health and Medical Sciences*, Vol.3, No.3, 288-301.

ISSN 2622-7258

DOI: 10.31014/aior.1994.03.03.124

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The *Journal of Health and Medical Sciences* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Journal of Health and Medical Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Medicine and Public Health, including medicine, surgery, ophthalmology, gynecology and obstetrics, psychiatry, anesthesia, pediatrics, orthopedics, microbiology, pathology and laboratory medicine, medical education, research methodology, forensic medicine, medical ethics, community medicine, public health, community health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, environmental health, and equity in health. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Health and Medical Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Health and Medical Sciences.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Journal of Health and Medical Sciences
Vol.3, No.3, 2020: 288-301
ISSN 2622-7258
Copyright © The Author(s). All Rights Reserved
DOI: 10.31014/aior.1994.03.03.124

Delusional Misidentification Syndromes: Psychopathology and Culture

Kevin Volkan[1,2]

[1] Department of Psychology, California State University Channel Islands, Camarillo, CA, USA
[2] Graduate Medical Education Program, Community Memorial Health System, Ventura, CA, USA

Correspondence: Kevin Volkan, Department of Psychology, California State University Channel Islands, Camarillo CA 93012, USA. Tel: +1 805 437 8867. E-mail: kevin.volkan@csuci.edu

Abstract
Delusional misidentification syndromes constitute a number of disorders that involve a myriad of delusions related to the identity of self or other. The forms of delusion range from misattribution of identity related to self, other, as well as parts of the body. Although rare, these syndromes are encountered in a number of different forms by medical and psychiatric personnel, as well as other types of mental health workers. This is especially true since many of the syndromes have organic etiology and are treated via medical rather than psychological intervention. Nevertheless, delusional misidentification syndromes often co-exist with psychiatric issues which can be helped by concurrent psychological treatment. Given that identity is central to human beings and their cultures, it is not surprising that delusional misidentification is represented in a number of cultural beliefs. Some cultural expressions of delusional misidentification may function as coping mechanisms for anxiety over loss of identity or the trauma of infant mortality.

Keywords: Capgras Syndrome, Fregoli Delusion, Prosopagnosia, Alien Hand, Body Dysmorphic Disorder

1. Introduction

Psychiatric disorders that are related to the concept of misidentification are labeled together as delusional misidentification syndromes (DMS) and are somewhat rare. In these syndromes someone, or something, is incorrectly identified as a person, part of the body, place, or thing. Thoughts and attribution of thoughts are also misidentified, in many cases to the point of being delusional. Most of these syndromes are more often than not related to organic abnormalities of the brain, or they may be a combination of organic problems with psychological issues, or in rare instances, may be purely psychological. Many DMS are often associated with psychoses and have only rarely been reported in non-psychotic individuals. They are, nevertheless, fairly uncommon, occurring in about 4% of patients presenting with functional psychoses (Melca et al., 2013).

2. Capgras Syndrome

This is a misidentification syndrome where a person holds a delusion or belief that an acquaintance, typically a close family member, has been replaced by an identical looking imposter. This syndrome can be transient, developing very quickly after a brain injury, or can take a chronic form where the delusion is long standing. The syndrome is named after the French psychiatrist Joseph Capgras (1873-1950) who first described the disorder in a 1923 paper and used the term 'illusion of doubles' to describe a case of woman who had various doubles that had taken the place of people she knew. For some people with Capgras syndrome, even inanimate objects such as chairs and animals can be imposters. Often patients are so disturbed with seeing their doubles that they remove all mirrors from house. In some cases, if the Capgras sufferer can be convinced that one person is not an imposter, they will transfer the Capgras delusion to someone else (Sinkman, 2008).

Capgras Syndrome can also be co-morbid with other mental health and medical problems including; Alzheimer's disease, Cotard's syndrome, epilepsy, Farh's disease, Fregoli delusion, Hashimoto's hypothyroidism, incubus syndrome, neurodegenerative disease, Diogenes syndrome, and Parkinson's disease (Bourget & Whitehurst, 2004; Ceylan et al., 2010; Chiu, 2009; Donnelly et al., 2008; Fischer et al., 2009; Josephs, 2007; Mishra et al., 2009; Pande, 1981; Rodríguez et al., 2011; Yalin et al., 2008). Capras syndrome has also been associated with the administration of morphine and ketamine (Bekelman & Hallenbeck, 2006; Corlett et al., 2010) as well as with lithium toxicity (Nagasawa et al., 2012).

Since the time Capgras syndrome was first described (and even a bit before) a number of theoretical explanations have been put forth as to its origins. As might be expected many of the early theories were psychoanalytically based. A comprehensive account of these early conceptualizations of Capgras has been compiled by de Pauw (1994). In this article de Pauw notes that many of the psychoanalytic explanations are mutually incompatible. These psychoanalytic theories include; defense against unconscious homosexuality, a regression to the early stage of primary narcissism (which some writers believe was due to anxiety), and a novel resolution to the Oedipal and (especially) the Electra complexes. Psychodynamic explanations seemed to make sense because the people being replaced by imposters were almost always close family members. However, on closer scrutiny of the literature this argument falls apart as other people or things are often found to also be imposters; including doctors and nurses, as well as entire buildings and other inanimate objects. In general, according to de Pauw psychoanalytic explanations tend to be "generally post hoc and teleological in nature, postulating motives that are not introspectable and defense mechanisms that cannot be observed, measured, or refuted" (p. 158). He concludes that while the presence of brain injury also does not fully explain Capgras syndrome this may be due to a breakdown in the manner in which sensory information is brought into the brain and the way it is stored (and presumably retrieved). In another review of the psychoanalytic explanations of Capgras syndrome, Christodoulou, et. al. (2009) report that Capgras symptoms were originally thought of as psychological defense mechanisms against repressed desires. These authors also state that the psychoanalytic ideas of projection and splitting might play a role in Capgras syndrome. A person who is unable to integrate repressed or 'bad' aspects of themselves might project these on to another person who would take on these characteristics in the form of a double. It may be that mechanisms such as projection and splitting do play a role in DMS. Cerebral pathology may make it difficult for the sufferer to process information related to the identity of others leading to confusion and possibly the inability to integrate other people with identity, feelings, and memories. Projection and splitting could then be a defense mechanism that helps the Capgras sufferer make meaning of their confusion. These ideas deserve further study.

Another issue in the published case literature on Capgras syndrome is the focus on the delusion of the imposter to the exclusion of other aspects of the syndrome. Closer scrutiny often demonstrates other DMS and psychotic/schizophrenic symptoms in Capgras syndrome cases. Many patients suffer from a sort of expanded Capgras syndrome where there are many other delusions present. Some of these delusions may be somatic in nature, with the patient experiencing bizarre changes to their bodies that can seem strange and alien. Even the patient's sense of self can change and subject to delusion. These symptoms are reminiscent of schizophrenia and it is no surprise that some cases of Capgras syndrome have a co-morbid diagnosis of schizophrenia, usually of the paranoid variety. Upon closer examination it can become difficult to make a differential diagnosis between Capgras syndrome and schizophrenia in many sufferers. Or the Capgras symptoms may be another aspect of the schizophrenic illness. In fact, studies have shown that misidentification symptoms occur in a large number of cases of schizophrenia, maybe even as high as 40% (Sinkman, 2008). Capgras

patients can be prone to acts of violence, especially against people they have misidentified (Bourget & Whitehurst, 2004). Given the relation of Capgras to paranoid schizophrenia this makes sense.

Modern clinicians and researchers now believe that Capgras syndrome and other DMS have an organic basis, which is specifically related to cerebral dysfunction. Neuroimaging studies have shown that lesions in the right hemisphere of the brain are common among Capgras syndrome sufferers. Some studies have demonstrated bilateral damage to the hemispheres in Capgras syndrome patients (Bourget & Whitehurst, 2004). In one small study 81% of Capgras syndrome sufferers also had neurodegenerative disease, usually involving the Lewy body. As would be expected, these Capgras syndrome sufferers were older than Capgras patients without neurodegenerative disease. This latter group were also more likely to suffer from paranoid schizophrenia, schizoaffective disorder, methamphetamine abuse, or other cerebrovascular problems. All patients in the study with Capgras syndrome and Lewy body disease also experienced visual hallucinations (Josephs, 2007).

While structural deficit models of the brain related to Capgras syndrome and other DMS are important, these biological explanations are not able to extricate the meaning of the specific delusions for DMS patients, and do not explain why the mind of these individuals creates imposters and doubles (Christodoulou et al., 2009). Therefore, psychological and cognitive processes remain important lines of research into DMS.

There is evidence to support the idea that an emotional processing module in the brain, especially as it related to feelings of familiarity and unfamiliarity, and its connection to facial recognition is flawed in Capgras sufferers (Pacherie, 2009). This flaw in emotional processing can be demonstrated via facial recognition tasks and eye movement patterns (Brighetti et al., 2007; Grignon & Trottier, 2005; Walther et al., 2010). Similar differences in audio perceptions related to working memory have also been reported for Capgras syndrome sufferers (Papageorgiou et al., 2002). In one dramatic case a Capgras syndrome patient had sexual relations with his wife, thinking she was a ‘double’. He had no feelings of familiarity with his wife whatsoever and essentially felt as if he were having sex with a different woman; so much so that he even changed his sexual behavior. The authors (Antérion et al., 2008) note that this may be the only known documentation of a patient who was able to make his wife into his mistress!

Some researchers believe that DMS results from a breakdown of the cognitive process of identification, in which a small discrepancy in input of stimuli results in misidentification and a denial the other’s true identity. Other researchers characterize a two-factor model in which an abnormality prompts a delusional belief. A second abnormality prevents the sufferer from rejecting this delusional belief even in the presence of strong evidence to the contrary. It may be that the initial delusions come about when the DMS sufferer attempts to explain their odd abnormal perceptions (Christodoulou et al., 2009).

As might be expected the typical treatment for Capgras syndrome is anti-psychotic medications. However, when anti-psychotic medication is only partially effective or not effective, the use of electroconvulsive therapy has been shown to be helpful. This is especially the case when Capgras syndrome is co-morbid with Parkinson’s Disease (Chiu, 2009).

3. Fregoli Delusion

Another, related misidentification syndrome is Fregoli delusion. This syndrome is named after the Italian actor Leopoldo Fregoli, who often changed appearances and identities during his performances. This type of delusion occurs when a person believes that a number of different people are actually one person who has the ability to change their appearance. The different people are usually familiar and are often considered to be hostile or persecutory to the Fregoli sufferer. This delusion is often thought of as a variant of Capgras syndrome and it seems the underlying neuropathology is similar, usually involving lesions to the right hemisphere of the brain. It has been difficult however, to clearly trace the delusional misidentification directly to the organic pathology since the syndrome is so often comorbid with psychotic disorders (Mojtabai, 1994; Novakovic et al., 2010).

In addition to psychoses, Fregoli delusion has been associated with a number of other disorders. Bruggemann and Garlip (2007) report a case of erotomania combined with Fregoli delusion in a 24-year-old woman. This woman believed a colleague who was the target of her erotomania, appeared as other people. While they did not find any overt pathology, they did note EEG differences in the right temporal lobe. This woman, as is typical for people with Fregoli syndrome,

also suffered from psychotic symptoms such as imagining she had become pregnant by her colleague and that she was his fiancée. She was treated via psychotherapy and neuroleptic medication, which lessened her symptoms. When the patient stopped taking her medication her psychotic symptoms returned. The authors conclude that the Fregoli delusion was secondary to paranoid schizophrenia. Fregoli delusion has also been associated with bipolar schizoaffective disorder and Hashimoto thyroiditis (Ceylan et al., 2010).

Melca et. al. (2012) describe two patients with Capgras syndrome and Fregoli delusion who also suffered from treatment resistant obsessive-compulsive disorder (OCD). One of the two patients also was diagnosed with paranoid personality disorder while the other with pervasive developmental disorder. Both patients in the study exhibited varying amounts of insight related to their OCD. The authors speculate that there may be a relationship between OCD and DMS.

Fregoli delusion has also been associated with violent behavior. Delavenne & Garcia (2011) report on a case of a paranoid schizophrenic woman who was convinced that a boyfriend was able to appear as other people so he could follow her. This patient had an episode of violent behavior associated with her Fregoli delusion. She had stopped taking her anti-psychotic medication six months prior to her violent outburst. Facial recognition tests and a CT scan of her brain revealed no abnormalities. Even though she was put back on anti-psychotic medication, her delusions returned after 10 days.

4. Variants of Delusional Misidentification Disorder

One research study has reported that Capgras syndrome, Fregoli delusion, and psychoses can be distinguished from one another by observing facial recognition reaction times. Patients suffering from DMS took longer to perform facial recognition tasks than psychotic patients, with Fregoli patients taking longer than Capgras patients. This may indicate differences in underlying pathology among psychotic, Capgras, and Fregoli disorders (Walther et al., 2010). However, facial processing does not explain why there are various subtypes of DMS, why the subject of a delusional misidentification is visually identified correctly, and why some DMS patients report having multiple doubles (Christodoulou et al., 2009). Young (2010) compared patients with DMS with other non-delusional facial recognition disorders. He concluded that the patients' experience is an important factor in the genesis and maintenance of the DMS. Some writers, notably Christodoulou, view DMS as consisting of four subtypes: Capgras syndrome, Fregoli delusion, intermetamorphosis syndrome, and subjective doubles syndrome. As stated above, Capgras syndrome involves the delusion that someone close to the sufferer has been replaced by a double. Fregoli delusion involves the sufferer having the delusion that a familiar person, who is typically hostile or persecutory, is taking on the forms of strangers. Intermetamorphosis syndrome is where the sufferer believes a familiar person has become a stranger (like in Fregoli delusion) but this stranger is also physically and psychologically similar to the familiar person, interchanging with them. Finally, subjective doubles syndrome is where a person has the delusion that other people are physically transforming into them (Christodoulou et al., 2009; Christodoulou et al., 1995; Christodoulou, 1986; Shah, 2012; Young, 2010). Another way, perhaps to look at these is as two subtypes, with intermetamorphosis being a variant of Fregoli delusion and subjective doubles syndrome being a variant of Capgras syndrome (where the familiar person being replaced is oneself).

5. Prosopagnosia

Prosopagnosia is the official term for face blindness, a disorder in which a person is unable to recognize the faces of others. This is a neurological condition that is not related to other syndromes or illnesses and can be caused by injury to the brain or congenital abnormalities of the brain (Van Belle et al., 2011; Van den Stock et al., 2012). The condition derives from a dysfunction in the medial cerebral hemisphere, more specifically the fusiform gyrus area of the temporal lobe in Brodmann area 37. Disruption in nerve pathways in this region lead to problems of face recognition, while the ability to recognize of other aspects of people and things, as well as cognitive and emotional processing, remains intact. The lack of facial recognition may be related to an inability to perceive emotions from facial stimuli. The mechanism by which faces are not recognized may be related to a lack of emotion when the person with prosopagnosia sees the face of someone they know. This may lead to the perception that the person isn't who they appear to be, and in this sense, the person is misidentified.

People with prosopagnosia are thought to compensate for the inability to recognize faces by using other cues, such as parts or of the body, or characteristics such as movement, almost anything except visualizing the face. One research study indicates that auditory cues such as voice recognition may be an important way in which people with prosopagnosia recognize others (Hoover et al., 2010).

6. Alien Hand Syndrome

Alien hand syndrome is where the hand or arm of a person seems to have a life of its own. It is a neurological problem, but it is intertwined with psychological constructs such as will (Sacco & Calabrese, 2010). It is a rare condition that usually turns up after a stroke, though it can also result from other trauma to the area of the brain which controls limb function when neurological messages somehow get scrambled in meaning.

There are some variations of alien hand syndrome, but all types are thought to be related to lesions in the medial frontal lobe, the corpus callosum and the parietal areas of the brain. Alien hand syndrome has also been seen in patients with neurodegenerative diseases involving corticobasal degeneration (e.g. prion-disease) and may be a precursor to the expression of neurodegeneration (Sacco & Calabrese, 2010).

Patients suffering from alien hand syndrome experience their hand as being controlled by external forces and are often astonished and frustrated by the errant hand (Biran & Chatterjee, 2004). A typical clinical presentation of the syndrome is as follows:

> "*Two weeks after stroke onset, the patient started to present involuntary and intermittent movements of the right arm, irregular in speed and usually with a slow onset. Also, levitation of the right arm occurred. She did not always seem aware of the problem. Her right hand frequently stroked the bed, but she never looked at it or attempted to intervene to stop the movements. The patient failed to recognize the affected limb as her own, personifying it and expressing the idea that it was under someone else's control."* (Bartolo et al., 2011,p. 484)

It has been postulated that three factors contribute to the sense of alien-ness of the affected limb; 1. There is disinhibition of the affected limb and it is disproportionately reactive to environmental stimuli; 2. The limb is under less volitional control by the sufferer and engages in perseverative, stereotyped movements which are linked together; 3. The sufferer is cognitively intact to the level where they are aware that the movements are abnormal (Biran et al., 2006).

There is no known cure, but alien hand syndrome tends to disappear after a few weeks or months. This usually coincides with the fading of the stroke trauma. The estimated prevalence of alien hand syndrome could be as much as one out of 100 among stroke patients (Nowak et al., 2014).

The idea of the alien hand has made a few appearances in popular culture. The film *The Hands of Orlac* (Gréville, 1961) which was later released under the title *The Hands of a Strangler*, tells the story of a famous concert pianist who sufferers horrendous injuries to his hands in a car accident. Fortunately, new hands are able to be successfully transplanted allowing the pianist to resume his career. However, unbeknownst to the pianist, his new hands were taken from an executed murderer. The new hands seem to have a will of their own which manifests as a desire to strangle people to death.

Biran and Chatterjee (2004) point out an excellent example of alien hand syndrome in the film *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (Kubrick, 1964). In the film the main character Dr. Strangelove, brilliantly played by Peter Sellers, has a right hand that seems to have a mind of its own. Strangelove's hand sometimes tries to choke him by grasping his throat and other times involuntarily giving a Nazi salute. During these episodes Strangelove does his best to restrain his right hand with his left one.

Lastly, it would be remiss not to mention the television show The Addams Family (*The Addams Family*, 1964) and the later film remake (Sonnenfeld, 1991). The television show and the film depict an eccentric, if not, goth-like family that includes "Thing" who is a hand. Thing is fully autonomous and mysteriously animated appendage with a will of his own who seems to have done away with the need of body.

7. Cotard's Syndrome

Cotard's syndrome is another rare syndrome possibly related to misidentification. Debruyne et. al. (Debruyne, 2017; Debruyne et al., 2013; Debruyne et al., 2013) have published a number of excellent reviews of Cotard's syndrome which are summarized here. In this syndrome, which was first described by Jules Cotard in 1880, a person has the delusion that they somehow, in all or part, do not exist. This manifests as the person believing they are dead, or have lost their soul, or no longer have any organs, etc. Cotard initially characterized the disorder as consisting of anxious melancholia related to ideas of damnation or rejection, insensitivity to pain, delusions of bodily non-existence and immortality. Cotard's syndrome is not included in the DSM V as a specific diagnosis. This is due to its rarity and its conceptualization under other disorders – typically schizophrenic delusions and depression. There has not been systematic scientific research done on the syndrome with most of the literature consisting of case studies which may or may not include neuroimaging. One of the rare scientific studies done in the modern era used data reduction techniques to analyze 100 cases of Cotard's Syndrome. This resulted in three types of syndromes related to Cotard's syndrome. The first type consists of psychotic depression with features of anxiety, melancholia, delusions of guilt, and auditory hallucinations. The second type called Cotard's type I was associated with hypochondriacal and nihilistic delusions in the absence of clinical depression. The third type, Cotard's type II includes anxiety, depression, auditory hallucinations, nihilistic delusions, delusions of immortality, and suicidal behaviors (Berrios & Luque, 1995). Prevalence rates for Cotard's syndrome are difficult to determine because of diagnostic overlap with other disorders. A study in China of older adults with psychiatric issues found an overall prevalence rate of 0.57%, However, when only severely depressed older adults were examined the prevalence rate jumped to 3.2%. In the study cited above by Berrios and Luque (1995), the mean age of Cotard's patients was 52, however, the disorder has been found in people of all ages, including in rare instances, adolescents and children. Women seem to suffer from the disorder more than men.

Sahoo and Josephs (2017) report that Cotard's syndrome has been associated with a number of other morbidities with uni-polar and bi-polar depression being the most common, followed by psychosis. Other psychiatric disorders associated with Cotard's syndrome include voluntary starvation, hydrophobia, lycanthropy, and *folie a' deux* (shared psychotic disorder). A number of organic conditions have also been associated with Cotard's syndrome. These include dementia, developmental disability, typhoid fever, stroke, superior sagittal sinus thrombosis, brain tumors, Capgras syndrome, cerebral arteriovenous malformation, various types of epilepsy, migraine, multiple sclerosis, Parkinson's disease, brain injury, etc. The authors examined 14 patients with Cotard's syndrome and found it to be associated with frontal lobe volume and blood supply loss, and right-side and bi-lateral hemisphere lesions. Research on Cotard's syndrome has not definitively found a cause for the disorder but has generated some plausible theories as to its etiology.

Treatment for Cotard's syndrome can include both psychological and medical modalities, though the psychiatric treatments are more prevalent, psychotherapy, including behavior therapy, is also used with Cotard's syndrome patients. Psychiatric medications for Cotard's syndrome include antipsychotics, sometimes in combination with SSRI antidepressants (Chan et al., 2009; Moschopoulos et al., 2016) Electroconvulsive therapy (ECT) has been used successfully for Cotard's syndrome. This is especially true for type I Cotard's syndrome, while for type II antipsychotic medication is the preferred treatment (Madani & Sabbe, 2007). The above treatment regimens appear to have good outcomes.

With regard to expressions of Cotard's syndrome-like aspects in popular culture, there are many examples. Probably the most obvious would be people who consider themselves to vampires, werewolves or zombies. The cultural representations of this in literature, film, and television are too numerous to list.

8. Body Dysmorphic Disorder

It is also possible to understand some other syndromes as being related to DMS. For instance, body dysmorphic disorder (BDD)[1] is where a person has the delusion that a limb or limbs, or other parts of the body do not belong to them. Estimates of up about 2% of the population may suffer from BDD, while the prevalence may be higher among college students and clinical populations at around 5%. Outpatient psychiatric populations have been estimated to be 5.8% while

[1] In specific incidences BDD has been labelled apotemnophilia, body integrity disorder, and xenomelia. These terms have been used somewhat interchangeably in the research literature.

inpatient psychiatric populations could be as high as 7.4% (Hong et al., 2019). However, it seems safe to assume that more extreme cases, for instance where a person makes an attempt to amputate a limb, are far fewer. BDD is now included in the DSM V as a diagnostic category where it is defined as the alteration or removal of a body part because it is thought by the sufferer to be somehow abnormal. Many people with this disorder report that amputation of the body part makes them feel whole or complete. In some cases, the person with BDD has a wish or compulsion to live as an amputee or a disabled person (American Psychiatric Association, 2013). The first scientific study of the disorder occurred in 2005 when First and Fischer studied 52 subjects and were able to report some more specific characteristics of the disorder. Among the findings were that most individuals with the condition are men, there is a preference for amputation on the left side, and a preference for amputation of legs rather than arms (First & Fisher, 2011).

It is not known if BDD has an organic etiology, or if it is psychological, or both. Sedda and Bottini (2014) give an excellent review of 37 years of studies which includes both psychological and neurological approaches to the disorder. Early psychological approaches to understanding BDD examined sexual motives and concluded that the disorder represented a paraphilia. Explanations for BDD included ideas such as;

1. Body modification is a way for bisexual subjects to preserve their masculinity
2. The fear of losing a limb transmutes to an impulse to amputate so that a person can feel superior
3. A desire for amputation is a learned response reinforced by a rehearsal of experiences with images of amputation
4. A desire for amputation can be an eroticized hatred of the mother figure
5. A desire for amputation is a learned response in childhood from seeing someone with crutches or an amputation getting attention and being happy
6. Body modification is related to a psychotic disturbance where the person is told by voices to remove a limb.

First and Fischer believed that apotemnophilia (an older term denoting the severe urge to amputate a limb) should not be included in BDD because the individuals in their study did not perceive a defect in the limb they wanted to amputate and did not complain about its appearance. They felt that sexual motivations in apotemnophilia were secondary and that the disorder was more akin to gender dysphoria, where the sufferer identifies as a person without the limb. The authors proposed the use of the term body integrity identity disorder to capture the nuances of the disorder. Other researchers argued that the sexual aspects of the disorder were more relevant than identity issues (De Preester, 2013). Sedda and Bottini (2014) characterize the psychological literature succinctly:

> *"In summary, psychological/psychiatric explanations for the desire to amputate a healthy limb include two main hypotheses: a sexual compulsion, belonging to the paraphilic core, and an identity disturbance, paralleling gender identity disorder. At present, no new psychological/psychiatric explanations have been proposed.*" (p.1259)

Brang, McGeoch, and Ramachandran (2008) make the case that the specific form of BDD known as apotemnophilia is neurological disorder. They found that two patients with apotemnophilia had heightened skin conductance in limbs below where they wish to have an amputation. They concluded that this arises from a congenital dysfunction in the right superior parietal lobe and its connection to the insula. This area of the brain "receives and integrates input from various sensory areas and the insula to form a coherent sense of body image" (p. 1306). Indeed, there seems to be a trend in understanding BDD to be a neurologic disease, however, there have only been a limited number of studies with inconsistent methodology, so it the issue is far from settled (Sedda & Bottini, 2014).

Treatment for BDD runs the gamut of psychological and psychiatric solutions. With regard to psychotherapeutic treatments cognitive behavior therapy (CBT) seems to be the most common modality and is generally thought to be effective in treating BDD (Rasmussen et al., 2017). However, a number of authors state that CBT is not effective for everyone suffering from BDD (Hong et al., 2019; Weingarden et al., 2019).

One recent study found the electroconvulsive therapy was effective in eradicating the symptoms of BDD (Başgül et al., 2020).

A German study found there were a number of barriers to treatment. These included a lack of perceived need for treatment, shame, younger age, and a preference for cosmetic and medical treatment over psychiatric treatment. The authors also found a number of characteristics associated with BDD including high BDD symptom severity, poor patient insight into their condition, a previous suicide attempt related to patient appearance, a co-morbid eating disorder, and

current major depressive disorder. Interestingly, the majority of subjects in this study were female and their appearance concerns included a wide range of areas in decreasing order of prevalence – skin, nose, hair, breasts, mouth, genitals, eyes, muscularity, hands, legs, ears, stomach, buttocks, and other facial features. The authors state that there are effective treatments for BDD and advocate for a stepped treatment model that first provides information about the condition and its prevention followed by online CBT, smartphone treatment apps, or specialized face-to-face treatments (Schulte et al., 2020).

An Iranian study using single-subject methodology found that CBT improved patient's BDD symptoms as well co-morbid depression and disability (Abbarin et al., 2018). A case study of a single adolescent female patient found that intensive CBT and exposure/response prevention reduced levels of general anxiety and increased functioning (Neziroglu et al., 2018).

Greenberg et. al. (2019) found that greater readiness/motivation to change, greater treatment expectancy, better baseline BDD related insight, significantly predicted better outcomes with CBT among BDD patients.

Wilhelm et. al. (2019) compared CBT to supportive psychotherapy and found that both therapeutic modalities were effective in treating BDD, but that CBT had greater efficacy. Another small (n=10) 12-week study by the same group examined the use of smartphone based Cognitive Behavioral Therapy (CBT) for the treatment of BDD. The results indicated that this modality of CBT resulted in good response 90 days post treatment with measures of BDD severity decreasing along with improvement of in BDD insight, functional impairment, and quality of life (Wilhelm et al., 2020). Another study using internet-based CBT reported good outcomes in treating BDD patients as well (La Lima, 2018).

Weingarden et. al. (2019) studied the use of d-cycloserine augmented CBT in patients with BDD in a small clinical trial. The authors were looking for a way to enhance standard CBT which they reported as not always being effective with BDD. They found that CBT augmented with d-cycloserine significantly reduced BDD related stress.

A neurological-oriented treatment study found the BDD subjects had abnormal amygdala–temporal connectivity at rest compared to healthy controls as measured by MRI. The administration of intranasal oxytocin was found to reverse resting state abnormality (Grace et al., 2019).

Hong et. al. (2019) writes that BDD is typically treated using CBT and pharmacotherapies, but these are not always effective. The authors review current pharmacotherapies which include anti-depressants, fluoxetine, and suggest that novel treatments such as intranasal oxytocin, atypical antipsychotics and neuromodulation treatments such as transcranial magnetic stimulation hold promise for treating BDD.

Other novel psychotherapy treatments have been suggested for BDD patients but have not yet been implemented. Scandiffio (2018), studied the feasibility of using two Japanese forms of psychotherapy – Morita therapy and Naikan therapy – for treating BDD sufferers using a manualized approach. He had five experts judge whether the use of these therapeutic modalities alone or as an adjunct to CBT would be beneficial. The judges tended to think these therapies could be beneficial.

BDD is a dramatic disorder that has been subject to being sensationalized. For instance, The Jerry Springer Show aired an episode titled "*I'm Happy I Cut Off My Legs*" on November 2, 2006 (TV.com, n.d.)[2]. In this episode a transsexual woman named Sandra describes in detail how she amputated both of her legs. Sandra describes how from an early age her legs just didn't feel right and that after she amputated them (using a handheld electric saw) she felt relieved as if a weight was lifted from her. To make the show even more sensational Springer has Sandra confront a man who was born without legs who berates her for being ungrateful for having legs to begin with. What Sandra describes is a textbook example of BDD. It is too bad that the show didn't explore her transition from being a man to a woman, since gender dysphoria is considered to be a separate diagnosis from BDD, and Sandra would be the rare case where it might be possible to study the intersection of both syndromes. The Jerry Springer Show aired an update with Sandra on January 17, 2007 in which she re-enacted the amputation of her legs from her trailer home.

[2] Unfortunately, the official site of the Jerry Springer Show (*Videos - The Jerry Springer Show*, n.d.) doesn't keep episodes this old on the site. In order to see this episode, it is necessary to search YouTube.com where it can usually be found posted.

9. Neuro-Psychoanalysis and Delusional Misidentification Disorders

While organic disturbances may cause delusional syndromes, the delusions themselves may play a role in repairing a damaged ego or sense of self. Freud (1924) believed that delusions served this function and were a compromise when some aspect of external reality overwhelms the ego's ability to function in it. The delusion puts a sort of band-aid over the inability of the ego to deal with external reality. However, reality continues to try to manifest itself so the delusion must be constantly renewed in a defensive fashion. This idea fits well with the neuropathology of DMS. The damage to brain function is the external reality and the delusion works as the defense against the impairment.

Neuroscientists, as outlined previously, have identified a relationship between focal brain damage and various delusional misidentification syndromes. The abnormal beliefs that people with these syndromes present is typically interpreted using a cognitive psychological framework. While cognitive interpretations can account for the formation of false beliefs, they are not satisfactory for explaining bizarre and persistent delusional states and why these states are resistant to being challenged. The newly emerging field of neuro-psychoanalysis is now attempting to understand why this is so. In many (but not all) cases of delusional misidentification, patients demonstrate some level of pathology in their self-awareness as well as regression to immature styles of thinking and defense mechanisms. It is thought that delusional patients that do not suffer this regression possibly have more cognitive reserves (Venneri & Shanks, 2010).

Brain abnormalities in the right medial-frontal and orbitofrontal regions result in ego-disequilibrium which in turn causes problems with ego boundaries and the inability of the ego to observe its own processes (Feinberg, 2010, 2011). This presents as difficulties in patients not knowing themselves and also, presumably, not knowing where they end, and others begin. Feinberg has proposed a four-tiered hierarchical model of delusional neuropathologies. This model begins with first level cognitive deficits which then lead to second level self-related deficits. The self-related deficits in turn lead to various primitive level defenses which include denial, projection, splitting and dissociation. This third level then results in the fourth level which are the presence of various delusional syndromes including delusional misidentification disorders (Feinberg, 2010). This model fits quite well with DMS, especially Capras syndrome, Cottard's syndrome, and Fregoli delusion where recognition of self and others are problematic. Disorders such as prosopagnosia would seem to spare regions of the brain that are related to ego-function and in disorders such as alien hand syndrome self/no self-confusion is mostly time-limited. In BDD, especially the apotemnophilia variety, sense of self/not self appears to be disrupted. Ego splitting has been also been noted (Thess, 2014). Dissociation of the body-self, as well as the parts of the body, from the ego points to the possibility of object relations pathology (Sarasohn, 2002).

It is not surprising to discover that insight oriented psychodynamic psychotherapy that challenges delusional beliefs systems exacerbates negative transference and emotional withdrawal of the patient. A more relational approach, addressing early object relations, as well as addressing super ego issues related to body hating and how these are enacted in the transference are possible successful psychoanalytic therapeutic approaches (Lemma, 2009; Thess, 2014).

10. Delusional Misidentification and Popular Culture

Appearances of DMS in popular and traditional cultural expressions are extensive. For the sake of brevity only a few are examined here. One of the best examples of a sort of Fregoli delusion which is central to the film *Being John Malkovich* (Jonze, 1999). In this film there is a tunnel in a strange half floor of an office building. Travel through this tunnel allows people to experience 'being' the actor John Malkovich for a short time. Later in the film, John Malkovich himself discovers the existence of the tunnel and goes through it. When he emerges everyone else is a version of Malkovich, with his face and everything they say coming out as the word *Malkovich*.

Science fiction has been an especially fruitful ground for the emergence of modern stories related to imposters masquerading as humans. This can be seen most readily in stories about robots or androids. In many cases these stories revolve around the 'imposters' wanting to become human, or being indistinguishable from humans, as in the Phillip K. Dick story *Do Androids Dream of Electric Sheep?* (1968/1996), which was made into the movie *Blade Runner* (Scott, 1982), or the Isaac Asimov Robot series (1982) which has had a number of film adaptations including most recently the film *I Robot* (Proyas, 2004). In these modern portrayals, humans are generally anxious about the imposter status of the robots and androids as well as being paranoid about their intentions. It is possible that the popularity of the imposters among us theme relates to a subconscious fear of misidentification in general and loss of identity in particular.

An older instance of DMS can be found primarily in the British Isles. In times past British or Celtic babies were sometimes thought to be kidnapped by fairies and replaced by identical looking children. The replacement children, called changelings, were often sickly and exhibited abnormal behavior.

Evans (2000) describes the Irish belief in changelings that is typical of the British Isles;

> *"Mothers and babies were thought to be especially liable to be abducted by the fairies, and protective charms were hidden in a baby's dress or placed in the cradle. When children were taken to be baptized, too, special preparations were made and precautions taken, for example, a County Antrim clergyman reported that his parishioners would place a piece of bread and cheese in the child's clothing.*
> *The old custom of dressing boys in girls' clothes, in long frocks, until they were ten or eleven years of age has been explained as a means of deceiving the fairies, who were always on the lookout for healthy young boys whom they could replace by feeble 'changelings'.*
> *For the same reason it is unwise to praise a child without adding a saving 'God bless him', and young boys are still half jocularly referred to as 'rogues and Tories'.*
> *The belief in 'changelings' may have arisen as an explanation of the high mortality rate among baby boys as compared with girls."* (p. 289)

Indeed, changeling legends may be related to high infant mortality rates in general. When an infant becomes sick and dies for no apparent reason, the human mind will seek an explanation for such a tragic event. If no logical reason can be found the human mind invents a reason that can provide meaning to the tragedy and lessen its sting. There is always a chance the original child can be returned by the fairies, or the thought the original child is being raised by the fairies and has been given special powers can be of comfort to the grieving parents. The death of a child is so difficult to accept that the trauma must be repaired with a delusion. In this case, the imposter delusion keeps the child alive[3].

11. Conclusion

Even though DMS are rare, they present with diverse forms that include delusion, cognitive deficits, and misidentification related to problems confusing and distinguishing between self and other. DMS primarily have an organic basis and therefore the primary modes of treatment for the disorders are medical. Nevertheless, brain abnormalities found in many DMS do give rise to psychological issues. Addressing these psychological issues may help people suffering from DMS better deal with disturbances in brain function. A number of psychological treatment modalities show promise in being able to accomplish this. The many instances of DMS-related cultural phenomena remind us that perhaps some level of delusion and misidentification is part of the human condition, serving to defend us from loss of identity and our mortality.

References

Abbarin, M., Zemestani, M., Rabiei, M., & Bagheri, A. (2018). Efficacy of cognitive-behavioral hypnotherapy on body dysmorphic disorder: Case study. *Iranian Journal of Psychiatry and Clinical Psychology*, *23*(4), 394–407. https://doi.org/10.29252/nirp.ijpcp.23.4.394

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). American Psychiatric Publishing.

Asimov, I. (1982). *The Complete Robot* (1st ed.). Doubleday.

Bartolo, M., Zucchella, C., Pichiecchio, A., Pucci, E., Sandrini, G., & Sinforiani, E. (2011). Alien hand syndrome in left posterior stroke. *Neurological Sciences*, *32*(3), 483–486. https://doi.org/10.1007/s10072-011-0490-y

Başgül, Ş. S., Luş, M. G., & Hashimov, A. (2020). Electroconvulsive therapy in an adolescent with bipolar disorder, substance use, and body dysmorphic disorder comorbidity: Case report. *Neurocase*, *26*(1), 51–54. https://doi.org/10.1080/13554794.2019.1683210

Bekelman, D. B., & Hallenbeck, J. (2006). Capgras Syndrome Associated with Morphine Treatment. *Journal of Palliative Medicine*, *9*(3), 810–813. psyh. https://doi.org/10.1089/jpm.2006.9.810

[3]Another belief related to infant mortality and the changeling legends is the 'evil eye' which has its origins in the Mediterranean regions. The warding off of the evil eye has a number of forms in different places and can be understood as a delusional belief that prevents infant mortality.

Berrios, G. E., & Luque, R. (1995). Cotard's syndrome: Analysis of 100 cases. *Acta Psychiatrica Scandinavica*, *91*(3), 185–188. https://doi.org/10.1111/j.1600-0447.1995.tb09764.x

Biran, I., & Chatterjee, A. (2004). Alien hand syndrome. *Archives of Neurology*, *61*(2), 292–294. https://doi.org/10.1001/archneur.61.2.292

Biran, Iftah, Giovannetti, T., Buxbaum, L., & Chatterjee, A. (2006). The alien hand syndrome: What makes the alien hand alien? *Cognitive Neuropsychology*, *23*(4), 563–582. psyh. https://doi.org/10.1080/02643290500180282

Bourget, D., & Whitehurst, L. (2004). Capgras Syndrome: A Review of the Neurophysiological Correlates and Presenting Clinical Features in Cases Involving Physical Violence. *The Canadian Journal of Psychiatry / La Revue Canadienne de Psychiatrie*, *49*(11), 719–725. psyh.

Brang, D., McGeoch, P. D., & Ramachandran, V. S. (2008). Apotemnophilia: A neurological disorder: *NeuroReport*, *19*(13), 1305–1306. https://doi.org/10.1097/WNR.0b013e32830abc4d

Brighetti, G., Bonifacci, P., Borlimi, R., & Ottaviani, C. (2007). "Far from the heart far from the eye": Evidence from the Capgras delusion. *Cognitive Neuropsychiatry*, *12*(3), 189–197. psyh. https://doi.org/10.1080/13546800600892183

Brüggemann, B. R., & Garlipp, P. (2007). A special coincidence of erotomania and fregoli syndrome. *Psychopathology*, *40*(6). psyh. https://doi.org/10.1159/000108127

Ceylan, M. F., Bulut, M., Virit, O., Selek, S., Bülbül, F., & Savaş, H. A. (2010). Hashimato tiroiditi olan erişkin bipolar bozukluk hastasinda capgras ve fregoli sendromu birlikteliği. *Yeni Symposium: Psikiyatri, Nöroloji ve Davraniş Bilimleri Dergisi*, *48*(1), 69–71. psyh.

Chan, J.-H., Chen, C.-H., Robson, D., & Tan, H. K. (2009). Case report: Effective treatment of Cotard's syndrome: Quetiapine in combination with venlafaxine. *Psychiatry and Clinical Neurosciences*, *63*(1), 125–126. https://doi.org/10.1111/j.1440-1819.2008.01891.x

Chiu, N.-M. (2009). Repeated electroconvulsive therapy for a patient with Capgras syndrome and Parkinsonism. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, *33*(6), 1084–1085. psyh. https://doi.org/10.1016/j.pnpbp.2009.06.003

Christodoulou, G., Margariti, M., Kontaxakis, V., & Christodoulou, N. (2009). The delusional misidentification syndromes: Strange, fascinating, and instructive. *Current Psychiatry Reports*, *11*(3), 185–189. https://doi.org/10.1007/s11920-009-0029-6

Christodoulou, G. N., Margariti, M. M., Malliaras, D. E., & Alevizou, S. (1995). Shared delusions of doubles. *Journal of Neurology, Neurosurgery & Psychiatry*, *58*(4), 499–501. https://doi.org/10.1136/jnnp.58.4.499

Christodoulou, George N. (1986). *Delusional Misidentification Syndromes* (1St Edition). S Karger Pub.

Corlett, P. R., D'Souza, D. C., & Krystal, J. H. (2010). Capgras syndrome induced by ketamine in a healthy subject. *Biological Psychiatry*, *68*(1), e1–e2. psyh. https://doi.org/10.1016/j.biopsych.2010.02.015

de Pauw, K. W. (1994). Psychodynamic approaches to the Capgras delusion: A critical historical review. *Psychopathology*, *27*(3–5), 154–160. https://doi.org/10.1159/000284864

de Pauw, Karel W. (1994). Psychodynamic approaches to the Capgras delusion: A critical historical review. *Psychopathology*, *27*(3–5), 154–160. psyh.

De Preester, H. (2013). Merleau-Ponty's sexual schema and the sexual component of body integrity identity disorder. *Medicine, Health Care, and Philosophy*, *16*(2), 171–184. https://doi.org/10.1007/s11019-011-9367-3

Debruyne, H. (2017). Cotard's syndrome. In B. A. Sharpless (Ed.), *Unusual and rare psychological disorders: A handbook for clinical practice and research.* (2017-30950-008; pp. 94–106). Oxford University Press.

Debruyne, H., Portzky, M., Peremans, K., & Audenaert, K. (2013). Cotard's syndrome. In N. Boutros (Ed.), *The international psychiatry and behavioral neurosciences yearbook—2012, Vol 2.* (2013-06323-012; pp. 161–173). Nova Biomedical Books.

Delavenne, H., & Garcia, F. D. (2011). Fregoli syndrome associated with violent behavior. *Jornal Brasileiro de Psiquiatria*, *60*(1), 71–72. psyh. https://doi.org/10.1590/S0047-20852011000100014

Dick, P. K. (1996). *Do Androids Dream of Electric Sheep?* Del Rey.

Donnelly, R., Bolouri, M. S., Prashad, S. J., Coverdale, J. H., Hays, J. R., & Kahn, D. A. (2008). Comorbid Diogenes and Capgras syndromes. *Journal of Psychiatric Practice*, *14*(5), 312–317. psyh. https://doi.org/10.1097/01.pra.0000336759.50060.5c

Evans, E. E. (2000). *Irish Folk Ways*. Courier Dover Publications.

Feinberg, T. E. (2010). Neuropathologies of the self: A general theory. *Neuropsychoanalysis*, *12*(2), 133–158. https://doi.org/10.1080/15294145.2010.10773637

Feinberg, T. E. (2011). Neuropathologies of the self: Clinical and anatomical features. *Consciousness and Cognition*, *20*(1), 75–81. https://doi.org/10.1016/j.concog.2010.09.017

First, M. B., & Fisher, C. E. (2011). Body integrity identity disorder: The persistent desire to acquire a physical disability. *Psychopathology*, *45*(1), 3–14. https://doi.org/10.1159/000330503

Fischer, C., Keeler, A., Fornazzari, L., Ringer, L., Hansen, T., & Schweizer, T. A. (2009). A rare variant of Capgras syndrome in Alzheimer's disease. *The Canadian Journal of Neurological Sciences/ Le Journal Canadien Des Sciences Neurologiques*, *36*(4), 509–511. psyh.

Freud, S. (1924). Neurosis and Psychosis. *The Standard Edition of the Complete Psychological Works of Sigmund Freud Volume XIX (1923-1925): The Ego and the Id and Other Works,* https://www.pep-web.org/document.php?id=se.019.0147a

Grace, S. A., Labuschagne, I., Castle, D. J., & Rossell, S. L. (2019). Intranasal oxytocin alters amygdala-temporal resting-state functional connectivity in body dysmorphic disorder: A double-blind placebo-controlled randomized trial. *Psychoneuroendocrinology*, *107*, 179–186. https://doi.org/10.1016/j.psyneuen.2019.05.022

Greenberg, J. L., Phillips, K. A., Steketee, G., Hoeppner, S. S., & Wilhelm, S. (2019). Predictors of response to cognitive-behavioral therapy for body dysmorphic disorder. *Behavior Therapy*, *50*(4), 839–849. https://doi.org/10.1016/j.beth.2018.12.008

Gréville, E. T. (1961, March 3). *The Hands of Orlac* [Crime, Horror, Sci-Fi, Thriller]. Pendennis Films Ltd., Riviera International Film, Société Cinématographique des Studios de la Victorine.

Grignon, S., & Trottier, M. (2005). Capgras Syndrome in the Modern Era: Self Misidentification on an ID Picture. *The Canadian Journal of Psychiatry / La Revue Canadienne de Psychiatrie*, *50*(1), 74–75. psyh.

Hong, K., Nezgovorova, V., Uzunova, G., Schlussel, D., & Hollander, E. (2019). Pharmacological treatment of body dysmorphic disorder. *Current Neuropharmacology*, *17*(8), 697–702. https://doi.org/10.2174/1570159X16666180426153940

Hoover, A. E. N., Démonet, J.-F., & Steeves, J. K. E. (2010). Superior voice recognition in a patient with acquired prosopagnosia and object agnosia. *Neuropsychologia*, *48*(13), 3725–3732. psyh. https://doi.org/10.1016/j.neuropsychologia.2010.09.008

Jonze, S. (1999, November 24). *Being John Malkovich* [Comedy, Drama, Fantasy]. Astralwerks, Gramercy Pictures (I), Propaganda Films.

Josephs, K. A. (2007). Capgras syndrome and its relationship to neurodegenerative disease. *Archives of Neurology*, *64*(12), 1762–1766. psyh.

Kubrick, S. (1964, January 29). *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* [Comedy]. Columbia Pictures, Hawk Films.

La Lima, C. N. (2018). *Therapist-guided, internet-based cognitive behavioral therapy for Body Dysmorphic Disorder - English Version (BDD-NET): A feasibility study* (2018-00726-133; Issues 2-B(E)). ProQuest Information & Learning.

Lemma, A. (2009). Being seen or being watched? A psychoanalytic perspective on body dysmorphia. *International Journal of Psychoanalysis; London*, *90*(4), 753–771.

Madani, Y., & Sabbe, B. G. C. (2007). Het cotardsyndroom: Differentiële behandeling volgens subclassificatie = Cotard's syndrome Different treatment strategies according to subclassification A case study. *Tijdschrift Voor Psychiatrie*, *49*(1), 49–53.

Melca, I. A., Rodrigues, C. L., Serra-Pinheiro, M. A., Pantelis, C., Velakoulis, D., Mendlowicz, M. V., & Fontenelle, L. F. (2013). Delusional misidentification syndromes in obsessive–compulsive disorder. *Psychiatric Quarterly*, *84*(2), 175–181. https://doi.org/10.1007/s11126-012-9237-z

Melca, I., Rodrigues, C., Serra-Pinheiro, M., Pantelis, C., Velakoulis, D., Mendlowicz, M., & Fontenelle, L. (2012). Delusional Misidentification Syndromes in Obsessive–Compulsive Disorder. *Psychiatric Quarterly*, 1–7. https://doi.org/10.1007/s11126-012-9237-z

Mishra, B. R., Prakesh, R., Mishra, B. N., Praharaj, S. K., & Sinha, V. K. (2009). Capgras syndrome associated with Fahr's disease. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *21*(3), 354–355. psyh. https://doi.org/10.1176/appi.neuropsych.21.3.354

Mojtabai, R. (1994). Fregoli syndrome. *Australian and New Zealand Journal of Psychiatry*, *28*(3), 458–462. psyh. https://doi.org/10.3109/00048679409075874

Moschopoulos, N. P., Kaprinis, S., & Nimatoudis, J. (2016). Cotard's syndrome: Case report and a brief review of literature. *Psychiatriki*, *27*(4), 296–302. https://doi.org/10.22365/jpsych.2016.274.296

Nagasawa, H., Hayashi, H., & Otani, K. (2012). Capgras syndrome occurring in lithium toxicity. *Clinical Neuropharmacology*, *35*(4), 204. https://doi.org/10.1097/WNF.0b013e31825ca207

Neziroglu, F., Bonasera, B., & Curcio, D. (2018). An intensive cognitive behavioral treatment for body dysmorphic disorder. *Clinical Case Studies*, *17*(4), 195–206. https://doi.org/10.1177/1534650118782439

Novakovic, V., Aje, O., & Sher, L. (2010). A patient with the Fregoli syndrome: A case report and discussion of the relevant literature. *International Journal on Disability and Human Development*, *9*(1), 81–83. psyh. https://doi.org/10.1515/IJDHD.2010.012

Nowak, D. A., Bösl, K., Lüdemann-Podubecka, J., Gdynia, H.-J., & Ponfick, M. (2014). Recovery and outcome of frontal alien hand syndrome after anterior cerebral artery stroke. *Journal of the Neurological Sciences*, *338*(1–2), 203–206. https://doi.org/10.1016/j.jns.2014.01.007

Pacherie, E. (2009). Perception, emotions, and delusions: The case of the Capgras delusion. In T. Bayne & J. Fernández (Eds.), *Delusion and self-deception: Affective and motivational influences on belief formation.* (pp. 107–125). Psychology Press; psyh.

Pande, A. C. (1981). Co-existence of incubus and Capgras syndromes. *The British Journal of Psychiatry*, *139*, 469–470. psyh. https://doi.org/10.1192/bjp.139.5.469

Papageorgiou, C., Lykouras, L., Ventouras, E., Uzunoglu, N., & Christodoulou, G. N. (2002). Abnormal P300 in a case of delusional misidentification with coinciding Capgras and Fŕegoli symptoms. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, *26*(4), 805–810. psyh. https://doi.org/10.1016/S0278-5846(01)00293-7

Proyas, A. (2004, July 16). *I, Robot* [Action, Mystery, Sci-Fi, Thriller].

Rasmussen, J., Gómez, A. F., & Wilhelm, S. (2017). Cognitive-behavioral therapy for body dysmorphic disorder. In K. A. Phillips (Ed.), *Body dysmorphic disorder: Advances in research and clinical practice.* (2017-43720-026; pp. 357–377). Oxford University Press.

Rodríguez, R. H., Madoz-Gúrpide, A., & Ustárroz, J. T. (2011). Propuesta de una batería neuropsicológica para la exploración del síndrome de Capgras. *Revista Española de Geriatría y Gerontología*, *46*(5), 275–280. psyh. https://doi.org/10.1016/j.regg.2011.06.001

Sacco, L., & Calabrese, P. (2010). Alien hand syndrome: A neurological disorder of will. *Schweizer Archiv Für Neurologie Und Psychiatrie*, *161*(2), 60–63. https://doi.org/10.4414/sanp.2010.02142

Sahoo, A., & Josephs, K. A. (2017). A Neuropsychiatric Analysis of the Cotard Delusion. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *30*(1), 58–65. https://doi.org/10.1176/appi.neuropsych.17010018

Sarasohn, K. (2002). Discussion: From an object relations perspective. *Psychoanalysis & Psychotherapy*, *19*(1), 91–96.

Scandiffio, M. J. (2018). *A manual for the implementation of Morita therapy and naikan therapy in the treatment of body dysmorphic disorder* (2018-40527-182; Issues 11-B(E)). ProQuest Information & Learning.

Schulte, J., Schulz, C., Wilhelm, S., & Buhlmann, U. (2020). Treatment utilization and treatment barriers in individuals with body dysmorphic disorder. *BMC Psychiatry*, *20*.

Scott, R. (1982, June 25). *Blade Runner* [Drama, Sci-Fi, Thriller].

Sedda, A., & Bottini, G. (2014, July 7). *Apotemnophilia, body integrity identity disorder or xenomelia? Psychiatric and neurologic etiologies face each other*. Neuropsychiatric Disease and Treatment; Dove Press. https://doi.org/10.2147/NDT.S53385

Shah, S. (2012). *Delusional Misidentification Syndrome*.

Sinkman, A. (2008a). The syndrome of Capgras. *Psychiatry: Interpersonal and Biological Processes*, *71*(4), 371–378. https://doi.org/10.1521/psyc.2008.71.4.371

Sinkman, A. (2008b). The syndrome of Capgras. *Psychiatry: Interpersonal and Biological Processes*, *71*(4), 371–378. psyh. https://doi.org/10.1521/psyc.2008.71.4.371

Sonnenfeld, B. (1991, November 22). *The Addams Family* [Comedy, Fantasy]. Orion Pictures, Paramount Pictures, Scott Rudin Productions.

The Addams Family. (1964, September 18). [Comedy, Family, Horror]. Filmways Television.

Thess, K. (2014). Körperdysmorphe Störung—Verlauf einer 650 Stunden umfassenden analytischen Behandlung = Bodydysmorphic disorder—Progress of 650 sessions of psychoanalytic therapy. *PDP Psychodynamische Psychotherapie: Forum Der Tiefenpsychologisch Fundierten Psychotherapie*, *13*(3), 176–191.

Thomas Antérion, C., Convers, P., Desmales, S., Borg, C., & Laurent, B. (2008). An odd manifestation of the Capgras syndrome: Loss of familiarity even with the sexual partner. *Neurophysiologie Clinique/Clinical Neurophysiology*, *38*(3), 177–182. https://doi.org/10.1016/j.neucli.2008.04.003

TV.com. (n.d.). *The Jerry Springer Show: I'm Happy I Cut Off My Legs!* TV.Com. Retrieved April 6, 2020, from http://www.tv.com/shows/the-jerry-springer-show/im-happy-i-cut-off-my-legs-908064/

Van Belle, G., Busigny, T., Lefèvre, P., Joubert, S., Felician, O., Gentile, F., & Rossion, B. (2011). Impairment of holistic face perception following right occipito-temporal damage in prosopagnosia: Converging evidence from gaze-contingency. *Neuropsychologia*, *49*(11), 3145–3150. psyh. https://doi.org/10.1016/j.neuropsychologia.2011.07.010

Van den Stock, J., Vandenbulcke, M., Zhu, Q., Hadjikhani, N., & de Gelder, B. (2012). Developmental prosopagnosia in a patient with hypoplasia of the vermis cerebelli. *Neurology*, *78*(21), 1700–1702. psyh. https://doi.org/10.1212/WNL.0b013e3182575130

Venneri, A., & Shanks, M. F. (2010). A neurology of awareness and belief: So near so far? *Neuropsychoanalysis*, *12*(2), 185–189. https://doi.org/10.1080/15294145.2010.10773644

Videos—The Jerry Springer Show. (n.d.). Jerry Springer. Retrieved April 6, 2020, from https://www.jerryspringertv.com/videos

Walther, S., Federspiel, A., Horn, H., Wirth, M., Bianchi, P., Strik, W., & Müller, T. J. (2010). Performance during face processing differentiates schizophrenia patients with delusional misidentifications. *Psychopathology*, *43*(2), 127–136. psyh. https://doi.org/10.1159/000277002

Weingarden, H., Mothi, S. S., Ladis, I., Hoeppner, S., Reese, H. E., Timpano, K., Siev, J., Rasmussen, J., Ragan, J., Dougherty, D. D., & Wilhelm, S. (2019). D-cycloserine-augmented behavior therapy for body dysmorphic disorder: A preliminary efficacy trial. *Cognitive Therapy and Research*, *43*(5), 937–947. https://doi.org/10.1007/s10608-019-10015-0

Wilhelm, S., Phillips, K. A., Greenberg, J. L., O'Keefe, S. M., Hoeppner, S. S., Keshaviah, A., Sarvode-Mothi, S., & Schoenfeld, D. A. (2019). Efficacy and posttreatment effects of therapist-delivered cognitive

behavioral therapy vs supportive psychotherapy for adults with body dysmorphic disorder: A randomized clinical trial. *JAMA Psychiatry*, *76*(4), 363–373.

Wilhelm, S., Weingarden, H., Greenberg, J. L., McCoy, T. H., Ladis, I., Summers, B. J., Matic, A., & Harrison, O. (2020). Development and Pilot Testing of a Cognitive-Behavioral Therapy Digital Service for Body Dysmorphic Disorder. *Behavior Therapy*, *51*(1), 15–26. https://doi.org/10.1016/j.beth.2019.03.007

Yalin, Ş., Taş, F. V., & Güvenir, T. (2008). The coexistence of Capgras, Fregoli and Cotard's syndromes in an adolescent case. *Nöropsikiyatri Arşivi/Archives of Neuropsychiatry*, *45*(4), 149–151. psyh.

Young, G. (2010). *Delusional Misidentification* (1st ed.). Nova Science Pub Inc.