

# Developing Hypnotic Analogues of Clinical Delusions: Mirrored Self- Misidentification

Amanda J. Barnier<sup>1</sup>, Rochelle E. Cox<sup>1</sup>, Akira O'Connor<sup>2</sup>, Max Coltheart<sup>1</sup>, Robyn  
Langdon<sup>1</sup>, Nora Breen<sup>3</sup>, and Martha Turner<sup>4</sup>

<sup>1</sup> Macquarie Centre for Cognitive Science (*MACCS*)

Macquarie University

Sydney, Australia

<sup>2</sup>Leeds Memory Group, Institute of Psychological Sciences

University of Leeds

Leeds, United Kingdom

<sup>3</sup>Neuropsychology Unit

Royal Prince Alfred Hospital

Sydney, Australia

<sup>4</sup>Institute of Cognitive Neuroscience

University College

London, United Kingdom

## Abstract

*Introduction.* Despite the prevalence of delusional beliefs there are currently no viable models for studying delusions in the laboratory. However, hypnosis offers an empirical technique for creating transient delusions that are resistant to challenge. The aim of this study was to develop a hypnotic analogue of mirrored-self misidentification and to explore the thoughts and explanations that “seed” the delusion.

*Methods.* Twelve high hypnotisable participants received a hypnotic suggestion to see either a stranger in the mirror, a mirror as a window, or a mirror as a window with a view to a stranger. Participants deluded beliefs were subsequently challenged and following hypnosis, the Experiential Analysis Technique was used to explore participants’ phenomenological experience of the delusion.

*Results.* The majority of participants did not recognise their reflection in the mirror and described the person as having different physical characteristics. These participants also maintained their delusional belief when challenged.

*Conclusions.* This study suggests that the hypnotic suggestion created a credible, compelling delusion that was resistant to challenge. Within Langdon and Coltheart’s (2000) two-factor model of delusions, these findings suggest that Factor 2 may involve a lowering of the criteria used to accept or reject delusional hypotheses.

Understanding delusions has been and continues to be of great theoretical and clinical interest but studying delusions in isolation is difficult as they frequently occur in association with other clinical conditions. Despite the prevalence of delusions in schizophrenia, various psychiatric disorders, and following brain injury (Davies, Coltheart, Langdon, & Breen, 2002), no viable models exist for testing delusions in the laboratory. Further, since delusions are resistant to challenge and are extremely disruptive to everyday life, a new empirically-based approach for investigating and understanding delusions is required. The instrumental use of hypnosis provides researchers with an innovative technique that allows delusions to be studied in the laboratory. During hypnosis, high hypnotisable individuals come to believe that the world is as suggested by the hypnotist. In response to hypnotic suggestions, perceptual processing is altered in a similar way to delusional experiences. For instance, during hypnosis, in response to suggestions from the hypnotist, individuals are temporarily convinced that their arm is floating in the air, they can no longer say their own name, or they feel no pain. Indeed, according to Sutcliffe (1961), hypnotised individuals are essentially deluded about the actual state of the world.

Hypnosis is a useful technique for investigating delusions for a number of reasons. First, hypnotic experiences share a number of features with delusions. Both are (1) believed with absolute conviction, (2) maintained regardless of overwhelming evidence to the contrary, and (3) resistant to rational counter arguments (Langdon & Coltheart, 2000). According to Kihlstrom and Hoyt (1988), hypnotic phenomena represent disorders of metacognition. During hypnosis, high hypnotisable individuals are unaware of their own cognitive processes and the resulting influence of these processes on their behaviour. Thus, their behaviour is influenced by beliefs about themselves and the world that are false but are nevertheless maintained with

conviction. Likewise, deluded individuals maintain false beliefs with conviction and similarly lack insight into the cognitive processes that give rise to these beliefs (even if they often have insight that their beliefs are abnormal; Davies et al., 2002).

A second reason for using hypnosis to investigate delusions is because extensive research indicates that hypnotic suggestions are effective at modelling a number of clinical phenomena. For instance, in the 1960's, Reyher and colleagues used posthypnotic suggestions to successfully model pathological symptoms, including repression and impulse inhibition (Burns & Reyher, 1976; Perkins & Reyher, 1971; Reyher, 1961, 1962, 1969; Reyher & Basch, 1970). In recent years, hypnosis has been used to model conversion hysteria (Halligan, Bass, & Wade, 2000), auditory hallucinations (Woody & Szechtman, 2000), functional amnesia (Barnier, 2002; Barnier & McConkey, 1999; Barnier, McConkey, & Wright, 2004; Cox & Barnier, 2003), and functional blindness (Blum, 1975; Bryant & McConkey, 1989a, 1989b).

Given that hypnotic phenomena and delusions are both essentially characterised by distortions of reality or distorted beliefs about reality, hypnosis should be a useful technique for investigating clinical delusions. However, there are few studies of clinically relevant hypnotic delusions (Burn, Barnier, & McConkey, 2001; Noble & McConkey, 1995; Zimbardo, Andersen, & Kabat, 1981) and even fewer contemporary comparisons of hypnotic and clinical cases (Kihlstrom & Hoyt, 1988). This study is part of a larger project that aims to assess the relationship between a variety of hypnotic and clinical delusions. We hope to develop a catalogue of compelling hypnotic analogues of clinical delusions and in doing so, explore the parameters and processes underlying these delusions.

Mirrored self-misidentification is one of eight monothematic delusions (delusions specific to one topic) identified by Davies et al. (2002) that may be successfully modelled using hypnosis. Mirrored self-misidentification is characterised by the belief that “the person I see in the mirror is not me” (Breen, Cain, Coltheart, Hendy, & Roberts, 2000). Breen et al. (2000) described two cases of mirrored self-misidentification. In case 1, Patient FE believed his reflection was another person who was following him everywhere. FE attempted to communicate with his reflection and was puzzled as to why the person never replied. Whilst looking in the mirror, FE reported the following (from Breen et al., 2000):

FE: That’s not me. It hit’s me straight away. First of all I didn’t like his face at all, but I’ve got used to his face and I’ll have a smile with him if I am in the bathroom for a wash or something, but it’s not me.

Examiner: What does that person look like?

FE: Well, he looks very much like me. I guess he could pass for F\_\_\_\_\_ E\_\_\_\_\_

Examiner: He does look like you

FE: Yes, I see that. He’s not a bad looking fellow

Examiner: What colour is his hair?

FE: I don’t think he is as white as I am (*FE has white hair and is balding*)

Examiner: Is he going a bit bald or does he have a full head of hair?

FE: Oh I think he’s about the same as mine as far as hair covering is concerned (*FE then tilts his head forward so that the top of the head of the reflected image is visible*)

The examiner then stood next to FE in front of the mirror with both of their reflections visible to FE.

Examiner: (*Pointing to her own reflection*). Who is this, next to the person?

FE: I don't know

Examiner: Who does it look like?

FE: That's you

Examiner: Me, here? (*Pointing to herself*). What's my name?

FE: I don't know, oh yes, it's Nora

Examiner: Nora, that's right. So that's me in the mirror?

FE: Yes

Examiner: That's my reflection?

FE: Yes

Examiner: And who is that? (*Pointing to FE's reflection*)

FE: I don't know what you would call him. It makes me a bit sick because he moves about freely with us. I don't be too friendly because I don't see it does him any good.

In case 2, patient TH also believed that he saw a stranger when he looked in the mirror. TH would often talk to his own reflection and thought it rude that the person never spoke back. TH stood at a mirror with an examiner who asked:

Examiner: At the moment in your bathroom, you have the curtain over the mirror don't you?

TH: Yes. There is a curtain over all the mirrors in the house

Examiner: So when you want to use the mirror, and you pull it up at the corner, pull the curtain up, what happens? What do you see?

TH: As soon as you lift the corner, you see him (*nodding his head at his reflection*)

Examiner: What happens when you shave?

TH: He'll get his razor and he'll be on the other side of the mirror, and I'll be on this side of the mirror, and we'll shave at the same time, sometimes.

It was discovered that TH suffered from mirror agnosia and no longer knew how a mirror worked. This led to his belief that the person he was seeing could not have been him, but a stranger who looked just like him.

Examiner: When you look in here (*indicating to the mirror*) tell me what you see?

TH: I can see your reflection and I can see Tom's reflection

Examiner: Tom who?

TH: I don't know his second name. He's been unable to tell me what his second name is apparently

Examiner: Is that because he doesn't talk to you?

TH: He doesn't talk to anyone

Examiner: Doesn't he?

TH: (*Looking at his own reflection*) Is that right? Do you talk to anyone? Can you talk? Can you talk or have you got trouble talking or you didn't learn to talk, you weren't taught? I don't know.

These examples illustrate the delusional beliefs that are held by individuals with mirrored self-misidentification. Both FE and TH are convinced that they see a stranger in the mirror and although they acknowledge that the person they see looks

similar to them, they nevertheless maintain that it is not them. Both FE and TH attempted to converse with their reflected image and were perplexed when the person in the mirror did not reply. Interestingly, when the examiner appeared in the mirror beside them in an attempt to challenge their beliefs, both FE and TH claimed that they could see her reflection in the mirror but continued to deny that the other person in the mirror was themselves.

Langdon and Coltheart (2000) have proposed a two-factor theory in an attempt to explain how monothematic delusions such as mirrored self-misidentification arise. According to this theory, there are two factors that contribute towards the development of delusional beliefs. Factor one involves a neuropsychological anomaly affecting perceptual and/or emotional processing, which is responsible for the content of delusions. For example, TH's neuropsychological anomaly was mirror agnosia. However, mirror agnosia can occur without delusional beliefs (Coltheart 2005), so factor one alone is not sufficient to account for the presence of a delusion. Langdon and Coltheart (2000; see also McKay, Langdon, & Coltheart, 2005) argued that a second factor must be involved to convert the neuropsychological anomaly, such as mirror agnosia, into a delusional belief. The proposed factor two involves damage to a system of belief evaluation and is responsible for a person's failure to reject delusional beliefs as implausible.

Thus, in mirrored self-misidentification, factor one may involve a problem processing familiar faces. Due to brain injury or a psychological disorder one's own face appears unfamiliar. Consequently, one's own reflection is interpreted as a stranger's face. Additionally, due to damage to a system of belief evaluation, the explanation that one's own reflection is a stranger is not rejected and the deluded belief is maintained. Conceptualised within this two-factor account, hypnosis offers a



powerful means to create and investigate delusions such as mirrored self-misidentification. A hypnotic suggestion can influence perceptual processing in a similar way to delusions whilst also altering belief evaluation. Hypnotised individuals accept as real, seemingly implausible events and when challenged, hypnotised individuals maintain their suggested experiences and process information in a way that supports their beliefs (Burn et al., 2001). Thus, hypnosis has excellent “instrumental” value as a laboratory analogue of clinical delusions.

This study used a hypnotic technique known as the Experiential Analysis Technique (EAT; Sheehan & McConkey, 1982) to explore the phenomenological experience of participants. Hypnotic responding is typically indexed by observable, behavioural responses but the EAT allows the private experience of the individual to be explored. To implement the EAT, the hypnosis session is videotaped and after hypnosis, the participant and a second, independent experimenter watch the videotape. Whilst watching the videotape, the participant is invited to comment on their experience of particular suggestions. The EAT examines the private experience of the individual and provides information on affect, imagery, intensity, effort, strategy, and volition associated with hypnotic responding (Barnier & McConkey, 2004).

The primary aim of this study was to create a viable hypnotic analogue of mirrored self-misidentification as part of a larger catalogue of hypnotic delusions. A group of talented high hypnotisable participants received a hypnotic suggestion to either see a stranger in the mirror, to see a mirror as a window, or to see a mirror as a window with a view of a stranger on the other side. The latter two suggestions were based on the clinical patient TH, who believed that a mirror functioned like a window and that his reflection was a stranger outside the window. Based on previous hypnotic

sex-change studies (Burn et al., 2001; Noble & McConkey, 1995), participants were expected to experience a subjectively compelling mirror delusion. Within the two-factor model, factor two is thought to involve the failure to reject implausible beliefs. Therefore, this study explored the types of thoughts and explanations that “seed” the delusion. In the EAT inquiry, participants were asked to explain their thoughts and beliefs at various stages throughout their suggested delusional experience. Finally, given that delusions are extremely resistant to challenge, this study also examined the circumstances under which a hypnotic delusion can be breached. During the suggested delusion, participants were administered two challenges, a contradiction and a confrontation, based on techniques used by Noble & McConkey (1995) and Burn et al. (2001) in studies of hypnotic sex-change. Following a suggestion to become the opposite sex, Noble & McConkey (1995) and Burn et al. (2001) administered a contradiction by asking participants what they would say to a hypothetical doctor who can find no reason for them to be the suggested sex. They also administered a confrontation by asking participants to open their eyes, look at themselves on a monitor and describe what they were experiencing as they did so. The present study modified these challenge techniques in an attempt to breach the suggested delusion. Given that delusions are typically resistant to challenge and that hypnotised individuals develop strong belief in the genuineness of their suggested experiences, participants were expected to maintain their deluded belief in response to these challenges.

## Method

### *Participants*

12 high hypnotisable participants (6 male and 6 female) of mean age 22.82 ( $SD = 11.87$ ) years participated in the experiment. Participants were undergraduate

psychology students at the University of New South Wales, who received credit towards their psychology course for their involvement. They were selected on the basis of their extreme scores on a modified 10-item version of the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962) and the 12-item Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962). All participants scored in the range **XX-XX** on the HGSHS:A ( $M = \mathbf{XX}$ ,  $SD = \mathbf{XX}$ ) and **XX-XX** on the SHSS:C ( $M = \mathbf{XX}$ ,  $SD = \mathbf{XX}$ ).

#### *Apparatus*

A Panasonic video camera was used to record the hypnosis and EAT sessions onto Sony digital video discs. A Panasonic television monitor was used during the EAT to playback the recording of the hypnosis session.

#### *Procedure*

The experiment involved two independent experimenters in either the experimental or the EAT session.

*Experimental session.* Following informed consent procedures, participants were administered a standard hypnotic induction (based on Weitzenhoffer & Hilgard, 1962) and then received one of three versions of the delusion suggestion: (1) self in mirror as a stranger, (2) mirror as a window or, (3) mirror as a window to a view of a stranger. Participants in the “self in mirror as a stranger” condition were told that when they opened their eyes and looked in the mirror they would see a stranger rather than themselves reflected in the mirror. Participants in the “mirror as a window” condition were told that when they opened their eyes they would see a window through to another room and would be able to see what was on the other side of the window. Participants in the “mirror as a window to a view of a stranger” were told

that when they opened their eyes they would see a window and through the window they would see a stranger.

Following the suggestion, participants were asked either what they could see in the mirror or what they could see through the window. They were asked to provide a detailed description of the person they could see, their gender, whether they had seen the person before and if so, who they thought it was, or if not, whether the person reminded them of anybody. They were asked to describe the ways in which the person they could see looked similar to them, the ways in which the person looked different to them, and how it was possible that the person they could see looked so similar to them.

The delusion was then challenged with a contradiction and a confrontation based on techniques used by Noble & McConkey (1995) and Burn et al. (2001). In the contradiction, participants were asked “if a close friend or member of your family came into the room now, how would they be able to tell you apart from the person you see?” In the confrontation, participants were asked to touch their nose whilst looking in the mirror, describe what the person in the mirror or window did and explain why they did it. Finally, participants were also asked why the person they could see always did what they did.

Following this, the suggestion was cancelled and a standard hypnotic de-induction administered (based on Weitzenhoffer & Hilgard, 1962). The first experimenter then left the room and a second experimenter entered to conduct the EAT.

*EAT session.* The second experimenter (who was not aware of participants’ hypnotisability) informed participants that she would show them the videotape of the hypnosis session they had just completed, stop the videotape at various points, and

ask them about their experiences. After watching a replay of the delusion suggestion, the second experimenter asked “what went through your mind as you listened to the suggestion?”, “what did you expect to happen?”, and “how did you go about having this experience?” Participants then watched a replay of themselves looking into the mirror for the first time following the suggestion. They were asked: “what thoughts did you have when you looked in the mirror?”, and “how did that make you feel?” Next, participants watched a replay of the questions they were asked during the delusion including the challenge procedures. The second experimenter asked: “what thoughts and feelings did you have when you were being asked these questions?” Finally, participants watched a replay of the cancellation and were asked: “what was it like when the hypnotist said this to you” and “how did you feel about what you had experienced?” At the completion of the EAT session, participants were invited to ask questions, debriefed, and thanked for their time.

## Results

### *Response to the Suggestion*

Participants were scored as passing the suggestion if they did not recognise their own reflection in the mirror. This was based on Noble and McConkey (1995) who scored participants as passing a sex-change suggestion if they did not deny their suggested sex. Table 1 presents the number and percentage of participants in each delusion condition who passed the suggestion. Collapsed across delusion conditions, 66.7% of participants passed the suggestion. The self in mirror as a stranger version and the mirror as a window to a view of a stranger version were more successful than the mirror as a window version. When participants initially looked in the mirror and were asked who they could see, the majority described another person in the mirror. The following is a transcript of one participant’s compelling experience”

Hypnotist: Tell me, what do you see?

Participant: (*Participant looks behind him*). Who's that?

Hypnotist: Tell me about what you see

Participant: Another person

Hypnotist: Tell me about the person

Participant: They're wearing a purple shirt, they've got a big nose, got a mole on their neck

Hypnotist: Is the person you see a male or a female?

Participant: Male (*Participant looks behind him*)

Hypnotist: Tell me more about what they look like

Participant: They've got short, curly hair, brown eyes, brown hair.

Hypnotist: Have you ever seen this person before?

Participant: No (*Participant looks behind him*)

Hypnotist: Does this person remind you of anyone?

Participant: I think I've seen him before at school

Hypnotist: Tell me about that....where you might have seen him.

Participant: I think he was in the year below me....yeah I knew there was something

Hypnotist: What do you think his name is?

Participant: Anthony

Hypnotist: In what ways does this person look like you?

Participant: Same coloured hair. I've got hazel eyes

Hypnotist: And what colour eyes does he have?

Participant: Brown

Hypnotist: In what ways does the person you can see look different to you?

Participant: Different coloured eyes. I think my nose is smaller....got bigger lips

Hypnotist: He has or you have?

Participant: I have....and I've got more freckles

Hypnotist: What is he doing at the moment?

Participant: Looking into the mirror. I don't know where he is though  
*(participant looks behind him and around the room)*

Hypnotist: Is he doing anything in particular or saying anything in particular?

Participant: Just looking at me. He's saying something but I can't understand

Hypnotist: Why can't you understand?

Participant: Because I can't lip read

Hypnotist: Can you hear him?

Participant: No

Hypnotist: How come?

Participant: Because I can only see him

This participant appeared to experience a subjectively real and compelling delusion. He displayed initial surprise at seeing the person in the mirror and appeared to be so convinced that it was a stranger that he frequently looked behind him in an attempt to find the person.

-----

Insert Table 1 about here

-----

Table 1 also presents the number and percentage of participants who described different physical characteristics for the person in the mirror. Collapsed across delusion conditions, 75.0% of participants described the person in the mirror as having different physical characteristics. When asked in what ways the person looked different to them, participants made comments such as “she looks different from me because her face is sort of a bit collapsed and her hair is longer” and “her eyes are different, her nose is bigger, her face is round.”

Although some participants did recognise themselves in the mirror, the majority (83.3%) nevertheless referred to their reflection in the third person (see Table 1). For instance, when describing what they saw in the mirror/through the window, participants said “she looks a bit sad,” and “he has the same hair”. When asked whether they had seen the person in the mirror/through the window before, 58.3% of participants said they had seen the person before. Of these participants, 57.1% identified the person as themselves, 14.3% identified the person as a relative, and 28.6% had seen the person before but didn’t know who they were. Participants who had not seen the person before were asked whether the person reminded them of anybody. Of these participants, 50% said they reminded them of a friend and 50% said they didn’t remind them of anyone.

To index any strategies used, participants were asked during the EAT inquiry how they went about having the suggested experience. The majority of participants (66.7%) described using some type of strategy. Of those who used a strategy, 50% reported focusing on particular features and altering their perception of those features. For example, one participant in the stranger condition said “I think I mainly



concentrated on the features....they seemed a bit exaggerated like pieces cut out of a magazine.” Another said “Just to pick out things that were different from what I thought I would look like. Some people think they look skinnier or fatter or whatever so I picked those things out, accentuated them, and then said that’s where the difference was.” The other type of strategy reported by participants involved using visual imagery (50%) such as “I was trying to picture somebody there” and “I pictured an office through the window and I was watching what was going on inside of an office.”

Participants were also asked during the EAT how they had felt upon looking into the mirror. The majority of participants (83.3%) described the experience as strange and/or uncomfortable. They made comments such as “it felt strange and almost disbelief that this person could look like me but not be me”, and “I felt quite tense....I was thinking why should this stranger look like my mother? It was a bit scary.” One participant in the stranger condition said “I just thought he was an idiot. He just kept looking at me from the corner of the mirror....I just wanted him to go away. He didn’t really look like anyone you could make a friend with because he just stared at me.”

### *Response to Challenges*

Participants’ responses to the challenge procedures focused on the 8 participants who passed the suggestion. During the contradiction, participants were asked how a close friend or a member of their family would tell them apart from the person they could see. In response to this question, 100% of participants continued to state that they saw a different person in the mirror/through the window. The majority of participants said that a close friend or family member would be able to tell them apart by their different features (62.5%). Another 25.0% of participants said that their

friends and family would just know that the person in the mirror was someone else, and 12.5% said they did not know how their friends and family would tell them apart.

The following transcript illustrates one participant's response to the contradiction:

Hypnotist: If a close friend or family member came into the room how would they be able to tell you apart from the person you see?

Participant: They would know by the quality of my skin and my features.....and the colour and style of my hair and my voice.

During the confrontation, when participants were asked to touch their nose, 100% of participants who passed the suggestion claimed that the person they could see was also touching their nose. Further, 100% of participants who passed the suggestion continued to maintain that they could see another person in the mirror/window. When asked why the person they could see also touched their nose 66.7% of participants said that the person was copying them, 16.7% of participants said the person touched their nose because they did, and 16.7% of participants did not know why the person touched their nose. The following is a transcript of one participant's response to the confrontation:

Hypnotist: I'd like you to touch your nose with your finger

Participant: He's copying me (*participant laughs*)

Hypnotist: What did he do?

Participant: He touched his nose (*participant laughs and looks behind him*)

Hypnotist: What do you think he did that?

Participant: Maybe he's trying to make me seem like I'm crazy or something.

Thus, in response to both the contradiction and confrontation procedures, all of participants who passed the delusion continued to maintain that they could see a

stranger in the mirror/through the window. Participants' EAT comments highlight their conviction in their suggested experience. When asked what they had been thinking and feeling during these challenge procedures, participants made comments such as "I remember thinking I wanted her (the hypnotist) to ask me more questions so I could work out what I was feeling and why it felt so bizarre" and "It was as if you were sitting there and you don't like someone and somebody gets a big photo of them and sticks it right in front of you and then makes you answer questions about it and you think oh I'd rather it was someone else." When describing her experience of touching her nose, one participant said "It made it more immediate because the hands were going up at the same time and it wasn't as if it was a picture.....it was like a real person."

#### *Beliefs, Thoughts, and Explanations*

During the suggested delusion, participants were asked to explain how it was possible that they looked so similar to the person they could see in the mirror/through the window. Although 1/3 of participants did not formally pass the suggestion only 18.2% responded to this question by stating that the person they could see was themselves. A further 27.3 % could not provide an explanation. Of the explanations provided, the most common was that the person co-incidentally had similar features (36.4%). Other explanations were that the person was a relative (9.1%), or that they were copying the participant (9.1%).

During the EAT inquiry, participants were asked what thoughts and expectations they had as they listened to the suggestion. One participant in the window to a view of a stranger condition said "I thought there was going to be an actual window.....I had a vivid image of a stranger....like a criminal." One participant in the stranger condition said "I thought that if it was a stranger I would probably do

things with my hands to see if he's copying me." Participants were also asked what thoughts they had when they first looked in the mirror. One participant in the window to a view of a stranger condition said "I thought wow there's an actual person behind that window.....I didn't know who she was and why she kept looking at me." Another participant in the same condition said "It was a stranger and the features reminded me of my mother.....and just the sort of feeling of dread, you know....what's she going to do? Break through the window?" One participant in the stranger condition said "the more I looked the more I saw someone else just looking back at me and I just thought it was a weirdo." One participant in the stranger condition looked around the room a number of times for the 'stranger' during the suggested experience. During the EAT he said "I really thought it was someone else in the mirror. That's why I looked behind me.....I thought someone was standing there and hence their reflection was in the mirror."

In order to examine the thoughts and explanations that 'seed' the delusion, participants were asked during the suggested delusion why the person they could see always did what they did. Of those who passed, 83.3% continued to maintain that they were seeing another person and 16.7% said the person always did what they did because it was their own reflection. The most common explanation was that the person was copying them. Other explanations included "maybe he's trying to make me seem like I'm crazy", "he's cheeky" and "she's outside and wants to come in so she's imitating me so I'll feel closer to her." Thus, participants had no difficulty eliciting explanations to justify their deluded belief.

### *Cancellation*

Following cancellation, 100% of participants saw their own reflection in the mirror. During the EAT they were asked to describe their reactions to the cancellation

instructions. One participant said “It was so good because I knew in the mirror I’d see myself and I could relax.” Another said “I didn’t recall the past times when I saw a different person...I didn’t want to remember it because I would’ve seemed like an idiot.” Participants also described their thoughts and feelings upon looking into the mirror after the suggestion had been cancelled. Participants made comments such as “I just felt kind of relieved that there was no stranger staring back”, “I looked in the mirror and I was expecting to see this other guy again but that other guy was actually me and I kind of realised that there wasn’t another guy before” and “it made sense again. It was kind of a relief. I had a bit of understanding about what I was seeing in the last one too.”

### Discussion

This study suggests that hypnosis is a useful analogue for creating a subjectively compelling mirrored self-misidentification delusion in high hypnotisable individuals. This study lays the groundwork for a larger project that aims to develop hypnotic analogues of a variety of monothematic delusions. Findings from this study indicate that the features of hypnotic mirrored self-misidentification are strikingly similar to clinical cases. The majority of participants did not recognise their reflection in the mirror, referred to themselves in the 3<sup>rd</sup> person, and described the person in the mirror/through the window as having different physical characteristics. Similarly, when their suggested delusion was challenged, all of the participants who passed continued to maintain that they did not recognise their reflection in the mirror. Finally, upon cancellation, participants expressed relief at no longer seeing a stranger.

These findings suggest a number of parallels between the features of hypnotic and clinical mirrored self-misidentification. Both are characterised by strong conviction that the person they see in the mirror is not them. During the EAT inquiry,

a number of participants in this study commented on the compelling nature of their experience and expressed strong belief that they were really seeing a stranger in the mirror. Although both clinical patients and hypnotic participants can often point out physical differences between themselves and the person they see in the mirror, both groups are also willing to acknowledge that the person they see looks similar to them. A number of hypnotic participants made comments such as “he probably looks a bit like me” and “she looks like me....because of the face and structure of her cheeks.” Interestingly, both clinical patients and hypnotised individuals also display elements of covert recognition (Breen et al., 2000). For example, when FE was asked what colour hair the person in the mirror had, he tilted his head forward to examine his hair in the mirror before replying that the person was not as white as him. Similarly, when TH was asked if the person he could see in the mirror was bald he replied, “yes, he’d have to be”. This indicates that at an implicit level, FE and TH may have had some awareness that the person in the mirror was actually their own reflection. Likewise, a number of hypnotic participants also displayed some level of covert recognition, making comments such as “he’s not me but there are bits and pieces. I can see bits and pieces.....” Additionally, one participant said the person she could see had the same first name as she did, indicating some awareness that it was her reflection.

Another similarity between hypnotic and clinical cases of mirrored self-misidentification involves the issue of conversing with the person in the mirror. Both the clinical patients TH and FE expressed frustration at not being able to converse normally with the person they saw in the mirror. One hypnotic participant described a similar experience during the suggested delusion saying, “he’s saying something but I can’t understand.” When asked why he couldn’t understand he said, “because I can’t lip read.” During the EAT inquiry, one participant said “I could hear my voice but I

could see him in the mirror moving his lips....I couldn't connect that to him being me." Another participant described how he had completely focused on the eyes and said "I'm sure if I had focused on something else I would've noticed the mouth was moving and stuff and I would've been like, he's talking but I can't hear him."

Both clinical patients and hypnotised individuals also expressed discomfort at seeing a stranger staring at them in the mirror. TH had a curtain covering all the mirrors in the house and said that whenever he lifted up the corner of a curtain he could see the stranger peering out at him. Similarly, one hypnotised participant commented, "when I can't see him, he can't see me." Another said, "I was poking my head around as if I was sort of looking at someone secretly." Additionally, FE mentioned that the stranger made him feel a bit sick because he moved about so freely with him. A number of hypnotised participants reported similar feelings of discomfort during the EAT claiming, "I felt kind of weird seeing someone just stare at me that close", and "I didn't trust the other person."

A final similarity is that both clinical and hypnotic individuals maintain their mirrored self-misidentification delusion in the face of challenge. Thus, despite being presented with evidence and rational counterarguments contrary to their beliefs, these individuals continue to believe that they are seeing a stranger. The clinical patients TH and FE were challenged when the examiner appeared in the mirror alongside them and asked them who they saw in the mirror. Although both patients could identify the examiner in the mirror, they continued to claim that their own reflection was a stranger. Likewise, during the contradiction and confrontation procedures in the current study, hypnotised individuals also maintained their belief that they were seeing a stranger, stating that their friends and family would have no trouble distinguishing them from the stranger and that the stranger was simply copying their

actions. Thus, these individuals were able to generate reasons that justified their deluded belief and were able to explain why the person they were seeing always did what they did.

Within the context of Langdon and Coltheart's (2000) two-factor model, in mirrored self-misidentification factor 1 is thought to involve a problem processing familiar faces such that one's own face appears unfamiliar. Interestingly, a number of participants made comments during the EAT inquiry about recognising their own face during the suggested delusion. One participant said "I felt I didn't know that person....or I didn't think that it was familiar", and another said, "usually when I look in the mirror I perceive myself as a whole but when I was looking at this....it was just like key bits that didn't really seem to fit together." Following cancellation, one woman said "I had a great feeling of relief....it was familiar." Thus, as in clinical cases, a hypnotic mirrored self-misidentification delusion also appears to impair feelings of familiarity about one's own face. Consequently, in both hypnotic and mirrored self-misidentification, impaired familiarity about one's own face may cause an individual to develop a delusional hypothesis that the person they see in the mirror is a stranger. According to Langdon and Coltheart (2000), delusional hypotheses such as this are accepted as beliefs due to a deficit in belief evaluation (factor 2).

In addition to impairing feelings of familiarity about one's own face, the hypnotic mirrored self-misidentification delusion appeared to create a deficit in belief evaluation (factor 2). In order to understand the factor 2 deficit, this study examined the thoughts and explanations generated by participants that "seed" their delusional beliefs. When participants were asked why they thought the person they could see always did what they did, the majority said that the stranger they could see was copying them. This somewhat simplistic explanation appeared to satisfy participants.



In fact, during the EAT one participant said that whilst listening to the suggestion he kept thinking that it wouldn't be effective. When he initially looked in the mirror he actively tried to convince himself that he was looking at his own reflection. However, when he touched his nose and saw the person in the mirror do the same he thought the person was copying him and could no longer convince himself that it was his own reflection. His belief that the person in the mirror was copying him appeared sufficient to convince him that he was looking at a stranger. This suggests that deluded individuals may indeed have a deficit in belief evaluation. The deluded beliefs of the hypnotised individuals in this study appeared to be heavily influenced by seemingly poor quality evidence. It is suggested that these participants may have lowered the criteria that they would normally use when weighing up evidence to develop beliefs.

Breen et al., (2000), have suggested that factor 2 may involve a failure to be influenced by evidence which would contradict or override a delusional hypothesis. Findings from this study suggest that in addition to this, deluded individuals may also have less stringent criteria for evaluating delusional hypotheses. Thus, deluded individuals may uncritically accept delusional hypotheses based on poor quality evidence. This is consistent with findings indicating that delusional individuals exhibit biases in their reasoning processes and often jump to conclusions (Bentall, Kinderman, & Kaney, 1994; Garety & Freeman, 1999). Studies have demonstrated the deluded individuals gather less evidence before reaching a conclusion and do not consider alternative explanations (e.g., Garety & Freeman, 1999; Stone & Young, 1997). It may be that deluded individuals do not consider alternative explanations because poor quality evidence that slightly favours a delusional belief is interpreted as overwhelming evidence due to less stringent belief evaluation criteria. Thus, factor 2

may involve a lowering of belief evaluation criteria such that poor quality evidence is accepted as sufficient justification for a deluded belief.

This study is the first in a series of experiments that will be used to develop a catalogue of hypnotic analogues of clinical delusions. In developing this catalogue we will examine the features and parameters of hypnotic delusions, the impact of challenging the delusions, and whether role-playing participants display the same behaviour as genuinely hypnotised participants. This initial study indicates that hypnosis is a useful and effective analogue of mirrored self-misidentification delusion. The hypnotic delusion was credible, compelling, and resistant to challenge. In addition to modelling the features of delusions, we also aim to identify the cognitive processes that may be occurring during a delusion. For instance, we will explore the impact of a suggested delusion on information processing and memory with a particular focus on selective facilitation and inhibition of information. In addition to investigating the parameters of hypnotic delusions, this program of research will also provide scope to empirically test theoretical accounts of delusions, such as the two-factor model. Thus, we hope to establish hypnosis as a new empirically-based framework for investigating and understanding delusions.

## References

- Barnier, A.J. (2002). Posthypnotic amnesia for autobiographical episodes: A laboratory model of functional amnesia? *Psychological Science, 13*, 232-237.
- Barnier, A.J., & McConkey, K.M. (1999). Autobiographical remembering and forgetting: What can hypnosis tell us? *International Journal of Clinical and Experimental Hypnosis, 47(4)*, 346-365.
- Barnier, A.J., & McConkey, K.M. (2004). Defining and identifying the highly hypnotisable person. In M. Heap, R.J. Brown, & D.A. Oakley (Eds.), *The highly hypnotizable person: Theoretical, experimental and clinical issues* (pp. 30-61). East Sussex, England: Brunner-Routledge.
- Barnier, A.J., McConkey, K.M., & Wright, J. (2004). Posthypnotic amnesia for autobiographical episodes: Influencing memory accessibility and quality. *International Journal of Clinical and Experimental Hypnosis, 52(3)*, 260-279.
- Bentall, R.P., Kinderman, P., & Kaney, S. (1994). The self, attributional processes and abnormal beliefs: Towards a model of persecutory delusions. *Behaviour Research and Therapy, 32*, 331-341.
- Blum, G.S. (1975). A case study of hypnotically induced tubular vision. *International Journal of Clinical and Experimental Hypnosis, 23*, 111-119.
- Breen, N., Caine, D., Coltheart, M., Hendy, J., & Roberts, C. (2000). Towards an understanding of delusions of misidentification: Four case studies. *Mind and Language, 15(1)*, 74-110.
- Bryant, R.A., & McConkey, K.M. (1989a). Hypnotic blindness, awareness, and attribution. *Journal of Abnormal Psychology, 98*, 443-447.

- Bryant, R.A., & McConkey, K.M. (1989b). Visual conversion disorder: A case analysis of the influence of visual information. *Journal of Abnormal Psychology, 98*, 326-329.
- Burn, C., Barnier, A.J., & McConkey, K.M. (2001). Information processing during hypnotically suggested sex change. *International Journal of Clinical and Experimental Hypnosis, 49*, 231-242.
- Burns, B., & Reyher, J. (1976). Activating posthypnotic conflict: Emergent uncovering psychopathology repression, and psychopathology. *Journal of Personality Assessment, 40*(5), 492-501.
- Coltheart, M. (2005). Delusional belief. *Australian Journal of Psychology, 57*(2), 72-76.
- Cox, R.E., & Barnier, A.J. (2003). Posthypnotic amnesia for a first romantic relationship: forgetting the entire relationship versus forgetting selected events. *Memory, 11*, 307-318.
- Davies, M., Coltheart, M., Langdon, R., & Breen, N. (2002). Monothematic delusions: Towards a two-factor account. *Philosophy, Psychiatry, and Psychology, 8*(2-3), 133-158.
- Garety, P.A., & Freeman, D. (1999). Cognitive approaches to delusions: A critical review of theories and evidence. *British Journal of Clinical Psychology, 38*, 113-154.
- Halligan, P.W., Bass, C., & Wade, D.T. (2000). New approaches to conversion hysteria. *British Medical Journal, 320*(7248), 1488-1489.
- Kihlstrom, J.F., & Hoyt, I.P. (1988). Hypnosis and the psychology of delusions. In T.F. Oltmanns & B.A. Maher (Eds.), *Delusional Beliefs* (pp. 66-109). Wiley series on personality processes. Oxford, England: John Wiley & Sons.

- Langdon, R., & Coltheart, M. (2000). The cognitive neuropsychology of delusions. *Mind and Language, 15*, 184-218.
- McKay, R., Langdon, R., & Coltheart, M. (2005). "Sleights of mind": Delusions, defences, and self-deception. *Cognitive Neuropsychology, 10(4)*, 305-326.
- Noble, J., & McConkey, K.M. (1995). Hypnotic sex change: Creating and challenging a delusion in the laboratory. *Journal of Abnormal Psychology, 104*, 69-74.
- Perkins, K.A., & Reyher, J. (1971). Repression, psychopathology and drive representation: An experimental hypnotic investigation of impulse inhibition. *American Journal of Clinical Hypnosis, 13(4)*, 249-258.
- Reyher, J. (1961). Posthypnotic stimulation of hypnotically induced conflict in relation to psychosomatic reactions and psychopathology. *Psychosomatic Medicine, 23*, 384-391.
- Reyher, J. (1962). A paradigm for determining the clinical relevance of hypnotically induced psychopathology. *Psychological Bulletin, 59(4)*, 344-352.
- Reyher, J. (1969). Comment on "Artificial induction of posthypnotic conflict". *Journal of Abnormal Psychology, 74(4)*, 420-422.
- Reyher, J., & Basch, J.A. (1970). Degree of repression and frequency of psychosomatic symptoms. *Perceptual and Motor Skills, 30(2)*, 559-562.
- Sheehan, P.W., & McConkey, K.M. (1982). *Hypnosis and experience: The exploration of phenomena and process*. Hillsdale, NJ: Erlbaum.
- Shor, R.E., & Orne, E.C. (1962). *The Harvard Group Scale of Hypnotic Susceptibility, Form A*. Palo Alto, CA: Consulting Psychologists Press.
- Stone, T. & Young, A. (1997). Delusions and brain injury: The philosophy and psychology of belief. *Mind and Language, 12*, 327-364.

- Sutcliffe, J.P. (1961). "Credulous" and "skeptical" views of hypnotic phenomena: Experiments in esthesia, hallucination and delusion. *Journal of Abnormal and Social Psychology*, 62, 189-200.
- Weitzenhoffer, A.M., & Hilgard, E.R. (1962). *Stanford Hypnotic Susceptibility Scale, Form C*. Palo Alto, CA: Consulting Psychologists Press.
- Woody, E., & Szechtman, H. (2000). Hypnotic hallucinations: Towards a biology of epistemology. *Contemporary Hypnosis*, 17(1), 4-14.
- Zimbardo, P.G., Andersen, S.M., & Kabat, L.G. (1981). Induced hearing deficit generates experimental paranoia. *Science*, 212, 1529-1531.

Table 1

*Experiencing the Delusion*

	Stranger	Window	Window + Stranger
Passed	3 (75%)	1 (25%)	4 (100%)
3 <sup>rd</sup> Person	3 (75%)	3 (75%)	4 (100%)
Physical Diffs.	2 (50%)	4 (100%)	3 (75%)