



## Transmitting delusional beliefs in a hypnotic model of folie à deux



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### ABSTRACT

Folie à deux is the transference of delusional ideas from one 'primary' individual to one or more 'secondary' individuals (Lasègue & Falret, 1877). However, it is difficult to investigate experimentally because often only one patient is identified as delusional. We investigated whether hypnosis could model the experiences of the secondary in this delusion. Our primary was a confederate, who displayed two delusional beliefs and attempted to transmit them to hypnotised subjects. We manipulated the status of the confederate so that they were portrayed as either "credible" or merely "interesting". Many high hypnotisable individuals adopted the confederate's beliefs and confabulated evidence in support of them. Also, subjects who interacted with a credible confederate extended their delusions beyond those displayed by the confederate. We discuss the strengths and limitations of this approach and suggest ways to improve the validity of this model.

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### 1. Introduction

Delusional beliefs typically are not shared, yet there have been many cases where one person has transmitted a delusion to another. Consider the case of a husband and wife who shared the delusion that the "Japanese mafia" were attempting to assassinate them (Shimizu et al., 2006), or the case of a mother and daughter who believed that family members were identical-looking impostors (Christodoulou, Margariti, Malliaras, & Alevizou, 1995). Folie à deux is the term used to describe this transference of delusional beliefs from one 'primary' individual to one or more 'secondary' individuals (Lasègue & Falret, 1877). This delusion is unique and interesting since delusional beliefs, by definition, are not usually shared and are "not understandable to same-culture peers" (American Psychiatric Association, 2013). However, it is poorly understood and often not diagnosed because sufferers lack insight and often only one person will seek treatment (Joshi, Frierson, & Gunter, 2006; Sacks, 1988).

The following clinical case, reported by Dewhurst and Todd (1956), highlights a number of features of folie à deux. A mother and daughter shared the delusion that both their sets of neighbours had persecuted them for 3 years by playing loud phonograph music records and recordings of a baby's voice. Originally, the daughter heard nothing unusual but the mother would constantly wake her in the middle of the night to complain about the sounds. The daughter eventually was able to identify the tune and even heard the music when she was miles away from home. Both the mother and daughter protested to their neighbours about the noises and also tried to stop the music by knocking on the bedroom wall. Upon investigation, it was revealed that neither of the neighbours had a phonograph or a baby to produce such sounds. The mother was found to be suffering from a senile psychosis and was considered the primary, as she "heard" the music a number of months before her

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daughter, the secondary. Interestingly, the daughter stopped hearing the sounds when she was briefly separated from her mother, though started hearing them again just before the mother returned.

As illustrated in this case, folie à deux often occurs in the context of a close interpersonal relationship, especially when those involved are socially isolated (Arnone, Patel, & Tan, 2006; Wehmeier, Barth, & Remschmidt, 2003). This social isolation may be due to physical disability, poverty, language difficulties, and/or geographic remoteness (Soni & Rockley, 1974), but Sacks (1988) argued that in most cases, it is self-imposed. The content of the delusion can vary from mundane to bizarre and shared hallucinations also frequently occur in this condition (Arnone et al., 2006). Primary individuals (who first hold the delusional belief) are considered to be more dominant, autonomous, intelligent and forceful, whereas secondary individuals are more passive, dependent, and highly suggestible (Sacks, 1988). Secondary individuals are thought to be psychologically healthy, yet may have an underlying vulnerability to psychosis (Arnone et al., 2006; Lazarus, 1985; Sacks, 1988). Social isolation also limits the secondary's ability to access information that might contradict the beliefs espoused by the primary (Lozzi et al., 1992). Notably, in many clinical cases, secondaries often abandon their delusional beliefs when separated from the primary (Langdon, 2013) without the need for further intervention or treatment.

According to Langdon and Coltheart (2000; see also Coltheart, 2007), in order to understand delusional beliefs, we need to answer two questions. First, we need to know what causes the delusional belief to arise in the first place. Second, we need to know why the delusional belief is not rejected. (Coltheart, Langdon, & McKay, 2011; Langdon & Coltheart, 2000) argued that the answers to these two questions involve two different mechanisms or factors. Factor 1 involves a breakdown in sensory or affective processing and is responsible for the content of the delusion. Factor 2 involves a belief evaluation impairment and is responsible for the maintenance of the delusional belief. Recently, Langdon (2013) proposed that in folie à deux, Factor 1 and Factor 2 for the primary is likely to be the result of neuropathological impairments (e.g., delusional disorder, schizophrenia) as is the case for unshared delusions. However, the source of Factor 1 and Factor 2 for the secondary is more contentious. Langdon (2013) suggested that for the secondary, Factor 1 content might come directly from communication with the primary (via repeated exposure to the primary's delusional beliefs). Meanwhile, his/her Factor 2 belief evaluation deficit might come from a pre-existing vulnerability (e.g., learning difficulties, schizotypal personality traits) that impairs their ability to critically evaluate incoming information. These factors could then be exacerbated by social isolation, which limits access to information that might contradict the delusional belief.

The two factor theory is a general cognitive model whereby anything that disrupts information processing in Factor 1 and Factor 2-like ways should produce delusional beliefs (Bortolotti, Cox, & Barnier, 2012). One novel and innovative way to do this in the laboratory is with hypnotic suggestion. Recently, researchers have used hypnosis to model a variety of pathological conditions including functional amnesia (Barnier, 2002; Cox & Barnier, 2003), obsessive compulsive disorder (Woody et al., 2005), auditory hallucinations (Szechtman, Woody, Bowers, & Nahmias, 1998), functional blindness (Bryant & McConkey 1989a, 1989b), conversion paralysis (Halligan, Athwal, Oakley, & Frackowiak, 2000) and importantly, delusional beliefs (Attewell, Cox, Barnier, & Langdon, 2012; Barnier, Cox, Connors, Langdon, & Coltheart, 2011; Barnier et al., 2008; Bortolotti et al., 2012; Connors, Barnier, Coltheart, Cox & Langdon, 2012; Connors, Cox, Barnier, Langdon, & Coltheart, 2012; Cox & Barnier, 2009a, 2009b, 2010; Rahmanovic, Barnier, Cox, Langdon, & Coltheart, 2012). Since clinical delusions often occur with other symptoms and impairments, hypnosis provides a unique opportunity to model them in isolation in the laboratory. By our view, specific hypnotic suggestions can produce delusional content akin to Factor 1 and the hypnotic context, which is known to disrupt reality monitoring (Bryant & Mallard, 2005), can impair belief evaluation akin to Factor 2.

Oakley and Halligan (2009) argued that hypnotic suggestions can produce “virtual patients” by disrupting selected aspects of information processing. In this way clinical delusions can be “brought into the laboratory” (Cox & Barnier, 2010). While some might claim that hypnosis is only modelling the surface features of clinical delusions, Woody and Szechtman (2011) noted that a good model need only be a likeness, not an exact replica. Models should be evaluated in terms of their usefulness such as their ability to generate new insights and inform theory. Since hypnosis is a situation where beliefs are transferred from one person (i.e., the hypnotist) to another (i.e., the subject), it is an ideal starting point for developing a model of folie à deux. It can also inform us about “normal” belief transference in the absence of neuropathological impairment.

It might be argued that transference of beliefs can occur between people in the absence of either hypnosis or neuropathological impairment. For example, in Asch's (1952, 1956) work on yielding to group pressure, subjects were placed in small groups (between 7 and 9 group members) and asked to publicly judge which of three lines was the same length as a target line. Aside from the subject, all other members of the group were confederates who together, made incorrect judgements about line length on 7 out of 12 trials. Asch found strong individual differences in response to this group pressure, with some subjects completely yielding to the majority. Those who yielded commented that they doubted themselves, felt puzzled and thought that the group was probably wrong. This indicates that many subjects may not actually have altered their private beliefs, which is quite different to the belief conviction typically expressed in cases of folie à deux. Furthermore, acquiescing about the length of lines is neither personally meaningful nor has any real-world consequences. In contrast, delusions in folie à deux are personally significant and can have quite serious consequences. Indeed, Nielssen, Langdon, and Large (2012) reported numerous cases of folie à deux where belief conviction was so powerful that it resulted in homicide.

Social transmission of false beliefs also occurs in the wider community, such as the belief that vaccines cause autism, or that climate change is a myth, despite overwhelming scientific evidence to the contrary. For these types of beliefs, evidence concerning the belief cannot be immediately tested via one's senses. However, in folie à deux, beliefs are often transferred despite immediate sensory and perceptual evidence to the contrary. This is illustrated in the case reported by Dewhurst &

Todd, (1956) where the mother convinced her daughter that the neighbours were playing music and recordings of a baby's voice. Here, the sensory evidence that no such sounds were emanating from the neighbours house was disregarded and/or outweighed by the delusional belief. This makes folie à deux a unique and interesting condition to investigate, as immediate sensory evidence cannot prevent belief transmission.

It is worth noting that social belief transmission for personally meaningful and unusual beliefs is sometimes seen in new religious movements or “cult” groups (e.g., Branch Davidians, Heaven's Gate, The People's Temple). However, there are a multitude of complex factors involved in these types of group delusions including social isolation, lack of access to contradictory evidence, charismatic group leaders, reinforcement from other group members, and an imbalance in power relationships. Indeed, some of these factors are likely to be similar to those involved in folie à deux. This highlights the value of using hypnosis to model this condition as it is potentially the only way to examine the transference of personally meaningful, unusual and/or bizarre beliefs in the laboratory. Therefore, in our first attempt at modeling folie à deux, we based our design on cases of folie à deux reported in the literature and focused on belief transmission between two individuals rather than larger, more complex groups.

In our hypnotic model of folie à deux, we asked a confederate to play the role of the primary rather than hypnotise two subjects simultaneously. If we attempted to hypnotise the primary, there would be no guarantee that they would experience the initial delusion and might thus have nothing to transmit to the secondary. Therefore, we decided to focus on the experiences of the secondary. The secondary's Factor 1 (delusional content) was provided via communication with the (confederate) primary and their Factor 2 (belief evaluation impairment) was provided by the hypnotic context.

One delusion we have modelled successfully with hypnosis is mirrored-self misidentification, which is the delusional belief that “I see a stranger when I look in the mirror” (Breen, Caine, Coltheart, Hendy, & Roberts, 2000). This delusion typically occurs in advanced global dementia (Bologna & Camp, 1997; Foley & Breslau, 1982; Mendez, Martin, Smyth, & Whitehouse, 1992) and patients have been known to cover up all the mirrors in their house to avoid encounters with the “stranger” (Breen et al., 2000). Across four experiments we have used a number of different hypnotic suggestions to model this delusion (Barnier et al., 2008, 2011; Connors, Barnier et al., 2012; Connors, Cox et al., 2012). We have consistently found that when responding to these suggestions, approximately two thirds of high hypnotisable subjects (i.e., subjects who respond readily to hypnotic suggestions and typically experience hypnotic effects as surprisingly involuntary and real, Kihlstrom (2008); see Barnier and McConkey (2004) for further information on defining and identifying high hypnotisable individuals) claim to see a stranger when they look in the mirror. These subjects look around the room for the “stranger”, claim that the stranger is copying their actions, and resist challenges to the delusion. Overall, they display striking similarities to clinical patients with mirrored-self misidentification.

Our first successful attempt at modelling mirrored-self misidentification involved a “fully formed” suggestion that instructed subjects to see a stranger when they looked in the mirror (Barnier et al., 2008). Later studies were based on Langdon and Coltheart's (2000) proposal that Factor 1 in mirrored-self misidentification might be either a face processing impairment where patients can no longer recognise their own face (Connors, Barnier et al., 2012), or mirror agnosia where patients interact with mirrors as if they are windows (Connors, Cox et al., 2012). We developed Factor 1 hypnotic suggestions designed to model these underlying pathways. For example, we gave participants a Factor 1 suggestion that they would not be able to identify the face they saw in the mirror (Connors, Barnier et al., 2012). Half of the participants received this suggestion while hypnotised, which was designed to model Factor 2, since hypnosis is known to disrupt the normal evaluation of experiences (Bryant & Mallard, 2005). The other half of the participants received the Factor 1 suggestion without hypnosis. To test subjects' beliefs, we asked them to open their eyes, look in a mirror, and describe what they could see. We found that high hypnotisable subjects who received the Factor 1 suggestion while hypnotised claimed to see a stranger when they looked in the mirror. In contrast, subjects who received the Factor 1 suggestion without hypnosis did not report seeing a stranger when they looked in the mirror. This suggests that hypnosis itself can disrupt belief evaluation in ways similar to Factor 2.

Given our success in modelling mirrored-self misidentification with hypnosis, we decided to examine whether this delusion could be transmitted from one individual to another in a hypnotic analogue of folie à deux. In addition, since shared auditory hallucinations are quite common in folie à deux, we also examined whether the belief that the people next door were playing Jingle Bells could be transmitted. This was based on the clinical case reported above, where a mother and daughter shared the belief that their neighbours were persecuting them by playing loud music (Dewhurst & Todd, 1956). We also manipulated the status of the primary/confederate. We told half of our subjects that the primary was credible and trustworthy, which we designed to mimic the close interpersonal relationships that exist in clinical cases of folie à deux (Wehmeier et al., 2003). We told the other half of our participants that the primary was merely interesting, which we designed to act as a neutral or control condition. The confederate entered the room on two separate occasions to display each delusional belief and attempted to convince subjects to share in their delusion.

This study was the first of its kind to examine whether a hypnotised subject would adopt the beliefs of another person who was not the hypnotist. No suggestions came directly from the hypnotist. Although hypnotised subjects will typically adopt the hypnotist's suggestions we do not know if they will do so with a complete stranger. Further, our subjects could directly test the beliefs of the primary since they had access to visual and auditory evidence that would contradict the primary's beliefs (e.g., they could see the primary's reflection in a mirror and they could hear that there was no music playing). We therefore expected more high than low hypnotisable subjects to adopt the beliefs of the primary since belief evaluation in high hypnotisable subjects should be impaired. Also, because clinical cases often involve people in a close interpersonal

relationship, we expected subjects who were introduced to a ‘credible’ primary to adopt these beliefs to a greater extent than subjects who were introduced to an ‘interesting’ primary.

## 2. Method

### 2.1. Design and participants

We tested 17 high hypnotisable subjects (2 male, 15 female) of mean age 24.35 years ( $SD = 10.92$ ) and 10 low hypnotisable subjects (2 male, 8 females) of mean age 23.80 years ( $SD = 7.28$ ) in a 2 (hypnotisability: high vs. low)  $\times$  2 (status: credible vs. interesting) between subjects design. Participants were undergraduate psychology students at Macquarie University, who received credit towards their psychology course or \$20 remuneration for their involvement. We carefully selected subjects based on their extreme scores on two standardised measures of hypnotisability. The first was the 10-item Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; [Shor & Orne, 1962](#)), which is a group administered scale that subjects self-score. The second was a modified 10-item version of the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; [Weitzenhoffer & Hilgard, 1962](#)), which is an individually administered scale that is scored by the hypnotist. High hypnotisable subjects (hereafter referred to as ‘highs’) scored 7–10 ( $M = 8.38$ ,  $SD = 1.17$ ) on the HGSHS:A and 8–10 ( $M = 9.00$ ,  $SD = 0.71$ ) on the SHSS:C.<sup>1</sup> Low hypnotisable subjects (hereafter referred to as ‘lows’) scored 0–3 ( $M = 2.60$ ,  $SD = 0.46$ ) on the HGSHS:A and 0–3 ( $M = 2.10$ ,  $SD = 0.57$ ) on the SHSS:C. We randomly allocated subjects to the credible condition ( $N = 14$ ; 9 highs, 5 lows) or the interesting condition ( $N = 13$ ; 8 highs, 5 lows).

### 2.2. Materials

We placed an empty chair for the confederate approximately 1 m opposite the subject’s chair. We mounted a mirror (68 cm  $\times$  52 cm) on the wall to the left of the subject’s chair and used a sheet of cardboard to cover the mirror when it was not in use. Subjects could see the confederate’s reflection (when the mirror was revealed), but not their own reflection. When instructed, subjects could lean forward in their chair and see both the confederate and themselves in the mirror. The hypnotist sat in a position so that their reflection in the mirror was not visible to the subject. We used a video camera to record the session.

### 2.3. Procedure

The experiment involved a hypnosis session and a postexperimental inquiry, both of which were conducted by the hypnotist in sessions lasting approximately 1.5 h.

#### 2.3.1. Hypnosis session

Following informed consent, the hypnotist administered the SHSS:C ([Weitzenhoffer & Hilgard, 1962](#)) hypnotic induction and the first nine SHSS:C items. Next, the hypnotist telephoned a confederate but did not verbally communicate with him/her. This served as a signal for the confederate to wait directly outside the hypnosis laboratory. The hypnotist then informed subjects that another person would enter the room. Specifically, she said:

In a moment someone else is going to come into the room to join us. His/Her name is [*confederate’s name*]. [*Confederate’s name*] will sit beside you, follow my instructions, and answer my questions just like you. [*Confederate’s name*] might also talk to you and you can talk to [*confederate’s name*]. Do you understand?

**Credible status suggestion.** For subjects in the credible condition, the hypnotist said:

[*Confederate’s name*], who is going to enter the room and sit beside you will be a very credible person. By credible I mean they are very believable and convincing. Their opinion matters to you and you will take it seriously. They are trustworthy like a close friend or relative. Do you understand? Okay, I am now going to invite [*confederate’s name*] to join us.

**Interesting status suggestion.** For subjects in the interesting condition, the hypnotist said:

[*Confederate’s name*], who is going to enter the room and sit beside you will be an interesting person. By interesting I mean that they might have interesting things to say. Their opinion matters to them and you should at least listen to it. They are as interesting as any other person you might meet. Do you understand? Okay, I am now going to invite [*confederate’s name*] to join us.

<sup>1</sup> The 10-item modified HGSHS:A included: head falling, eye closure, hand lowering, finger lock, moving hands together, communication inhibition, experiencing of fly, eye catalepsy, posthypnotic suggestion, and posthypnotic amnesia; arm rigidity and arm immobilisation items were removed to ensure that the procedure could be conducted within the time limits of a 1 hour class. The 10-item modified SHSS:C included: hand lowering, moving hands apart, mosquito hallucination, taste hallucination, arm rigidity, dream, age regression, arm immobilisation, negative visual hallucination, and posthypnotic amnesia; anosmia and auditory hallucination items were removed and the procedure was combined with the folie à deux suggestions in 1.5 hour individual sessions.

The hypnotist then said, “come in” loudly and waited for the confederate to enter the room. This was followed by two folie à deux items – a mirror folie à deux item and an auditory folie à deux item. The order of these two items was counter-balanced across subjects and they were separated by an unrelated olfactory hallucination suggestion.

**Mirror folie à deux.** Upon entering the room, the confederate quietly revealed a previously covered mirror (while subjects’ eyes were still closed) and then sat in a chair opposite subjects. To begin, the hypnotist asked subjects to open their eyes and introduced them to the confederate. The hypnotist then engaged in a verbal interaction with the confederate so that the confederate could demonstrate mirrored-self misidentification delusion (i.e., the belief that their reflection in the mirror was a stranger). This interaction between the hypnotist and confederate was based on a high hypnotisable subject from a previous experiment who had received a suggestion to see a stranger in the mirror (Barnier et al., 2008). Subjects simply watched this interaction, which progressed as follows:

HYPNOTIST: Now [*confederate’s name*], have a look in here [*point to mirror*] and tell me, what do you see?

CONFEDERATE: [*Looks behind him/her*] Who’s that?

HYPNOTIST: Tell me about what you see.

CONFEDERATE: Another person. A stranger.

HYPNOTIST: Tell me about the person. What are they wearing?

CONFEDERATE: They’re wearing [*same as confederate’s clothes*].

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

CONFEDERATE: Male/Female [*same as confederate*] [*looks behind him/her*].

HYPNOTIST: Tell me more about what they look like.

CONFEDERATE: They’ve got [*same hair colour, different eye colour*].

HYPNOTIST: Is it [*subject’s name*] or me that you see?

CONFEDERATE: No.

HYPNOTIST: Have you ever seen this person before?

CONFEDERATE: No [*looks behind him/her*].

HYPNOTIST: I’d like you to touch your nose with your finger.

CONFEDERATE: He’s/She’s copying me [*laughs*].

HYPNOTIST: What did he/she do?

CONFEDERATE: He/She touched his/her nose [*laughs and looks behind him/her*].

HYPNOTIST: Why do you think he/she did that?

CONFEDERATE: I don’t know [*laughs*]. Maybe he’s/she’s trying to make me seem like I’m crazy or something.

**Test of confederate’s reflection.** Next, the confederate turned towards subjects and asked their opinion about the “stranger” (i.e., about the confederate’s reflection). At this stage, subjects could only see the confederate’s reflection in the mirror. Specifically, the confederate asked:

Hey [*subject’s name*]. Tell me, who do you see there [*point at confederate’s reflection*]?

If subjects claimed to see the confederate’s reflection, the confederate attempted to convince them that it was a stranger by making comments such as: “No, it’s definitely not me! Can’t you see it’s a stranger?” If subjects continued to maintain that they could see the confederate’s reflection, the confederate made one final attempt to convince them that it was a stranger by commenting: “But they even look a bit different to me. It’s a stranger . . . don’t you see the stranger?” If subjects still reported seeing the confederate’s reflection, the confederate asked no more questions and the hypnotist cancelled the suggestion in the following way:

Okay [*subject’s name*], that’s fine. You see the reflection of [*Confederate’s name*]. This is a normal mirror that reflects things exactly as they are. Just close your eyes again and relax. [*Confederate’s name*] is now going to step out of the room for a moment.

However, if at any stage subjects said they saw somebody other than the confederate in the mirror, the confederate asked the following questions:

- (1) Is the person you can see a male or female?
- (2) What do they look like?
- (3) Is there anything about them that looks similar to me?
- (4) Is there anything about them that looks different to me?
- (5) Have you ever seen this person before? (If yes – who is this person?)
- (6) How do you explain seeing this person in there?

The confederate reinforced and agreed with subjects’ responses to these questions (provided that subjects continued to say it was a stranger).

**Test of subject's reflection.** Subjects who reported that the confederate's reflection was a stranger were then tested on their own reflection. To do this, the confederate asked subjects to lean forward in their chair and look at their own reflection (i.e., at the subject's reflection). Specifically, the confederate said:

Hey [*subject's name*], lean forward in your chair so that you are looking directly in here too [*point to mirror*]. Tell me, who do you see there [*point to subject's reflection*]?

If subjects claimed to see their own reflection, the confederate asked no more questions and the hypnotist cancelled the suggestion.

However, if subjects said they saw somebody other than themselves, the confederate asked:

- (1) Is the person you can see a male or female?
- (2) What do they look like?
- (3) Is there anything about them that looks similar to you?
- (4) Is there anything about them that looks different to you?
- (5) Have you ever seen this person before? (If yes, Who is this person?)
- (6) How do you explain seeing this person in there?

**Mirror challenge.** If subjects continued to claim that their own reflection was a stranger, the confederate administered a challenge by saying:

Try touching your nose with your finger. [*Wait for response*] What did he/she do [*point to subject's reflection*]? Why did he/she do that?

**Cancellation of mirror folie à deux.** To cancel the mirror folie à deux suggestion for subjects who reported seeing either the confederate's reflection as a stranger and/or their own reflection as a stranger, the hypnotist said:

In a moment, I will ask you to open your eyes and look in the mirror again. When you do, you will see the reflection of [*Confederate's name*] and if you lean forward, you will see your own reflection. This is a normal mirror that reflects things exactly as they are. Now just slowly open your eyes, lean forward and tell me what you see...

The hypnotist checked that subjects could see both the confederate's reflection and their own reflection before telling them to close their eyes again while the confederate left the room.

**Reminder of status suggestion.** Just before the second folie à deux suggestion, the hypnotist again telephoned the confederate to signal them to wait outside the hypnosis laboratory. The hypnotist then reminded subjects of the status of the confederate by repeating the status suggestion.

**Auditory folie à deux.** To begin auditory folie à deux, the hypnotist said, "come in" loudly and waited for the confederate to enter the room. The confederate sat in a chair opposite subjects and the hypnotist asked subjects to open their eyes. The hypnotist then engaged in a verbal interaction with the confederate so that the confederate could demonstrate the belief that the people in the room next door were playing Jingle Bells. Subjects simply watched this interaction, which progressed as follows:

CONFEDERATE: Hey, can you hear that?

HYPNOTIST: Hear what?

CONFEDERATE: That music.

HYPNOTIST: Music?

CONFEDERATE: Yeah, I'm pretty sure I can hear music next door.

HYPNOTIST: What type of music is it? Can you describe it?

CONFEDERATE: The people next door are playing ... I think it's Jingle Bells!

HYPNOTIST: Playing Jingle Bells?

CONFEDERATE: Yeah, it sounds like a stereo playing Jingle Bells quite loudly.

HYPNOTIST: Tell me more about what you hear.

CONFEDERATE: The music seems to be getting louder. I am certain that it is coming from the room next door.

HYPNOTIST: Are people singing or is it a recording of Jingle Bells?

CONFEDERATE: There is no singing, just the tune of Jingle Bells. I can hear it quite clearly.

**Test of auditory suggestion.** To test whether subjects heard the music, the confederate turned to them and said:

Hey [*subject's name*]. What do you hear?

If subjects claimed that they did not hear music, the confederate attempted to convince them that there was music playing by making comments such as: "There is definitely music playing! Can't you hear it?" If subjects continued to maintain that they did not hear the music, the confederate made one final attempt to convince them that there was music playing by saying: "But it is getting louder. It's Jingle Bells ... don't you hear Jingle Bells?" If subjects still reported hearing no music, the confederate asked no more questions and the hypnotist cancelled the suggestion.

However, if at any stage subjects reported hearing music the confederate asked:

- (1) Is the music you hear Jingle Bells?
- (2) Can you tell what side of the room it's coming from?
- (3) How loud is it?
- (4) Can you hear any singing or just the tune of Jingle Bells?
- (5) Why do you think they would be playing Jingle Bells next door?

**Cancellation of auditory folie à deux.** The hypnotist cancelled the auditory suggestion by telling subjects that they could no longer hear music and that the people next door were not playing Jingle Bells. The hypnotist then asked subjects to close their eyes again while the confederate left the room.

To conclude the hypnosis session, the hypnotist administered the SHSS:C deinduction (based on Weitzenhoffer & Hilgard, 1962), which involved counting backwards from 20 to 1 while instructing subjects to become awake and alert. The deinduction included the 10th SHSS:C item – a posthypnotic amnesia suggestion to forget the events of hypnosis. After the deinduction, the hypnotist tested and cancelled the posthypnotic amnesia suggestion before proceeding to the postexperimental inquiry.

### 2.3.2. Postexperimental inquiry session

The hypnotist began the postexperimental inquiry by asking subjects what they had been thinking when she told them that someone was going to enter the room who would be credible/interesting. The hypnotist then asked about subjects' experiences of both folie à deux items.

**Mirror folie à deux questions.** For the mirror folie à deux item, the hypnotist asked subjects what they were thinking when the confederate said he/she saw another person in the mirror. She also asked subjects to think about the confederate's beliefs and to rate on a 7 point Likert scale what they thought the confederate had believed at the time (1 = "didn't believe confederate was seeing a stranger", 7 = "completely believed confederate was seeing a stranger"). She then asked subjects to rate what they themselves believed about the confederate's reflection (1 = "didn't believe it was a stranger", 7 = "completely believed it was a stranger"). Finally, the hypnotist asked highs who were tested on their own reflection to rate how much they believed that their own reflection was a stranger on a 7 point Likert scale (1 = "didn't believe it was a stranger", 7 = "completely believed it was a stranger").

**Auditory folie à deux questions.** For the auditory folie à deux item, the hypnotist asked subjects what they were thinking when the confederate said he/she could hear Jingle Bells playing. She also asked subjects to think about the confederate's beliefs and to rate on a 7 point Likert scale what they thought the confederate had believed at the time (1 = "didn't believe confederate could hear music", 7 = "completely believed confederate could hear music"). She then asked subjects to rate what they themselves believed about the music (1 = "didn't believe there was music playing", 7 = "completely believed there was music playing").

Finally, the hypnotist debriefed subjects, allowed them to ask questions, and thanked them for their time.

## 3. Results

The hypnotist and an independent rater (who worked in the Hypnosis Laboratory and was trained in hypnosis but was unaware of participants' hypnotisability) categorised subjects' responses to the folie à deux suggestions. Inter-rater reliability for all categorisations was >90% with the few disagreements resolved via discussion.

### 3.1. Beliefs about the confederate

In the postexperimental inquiry we asked subjects what they were thinking when the hypnotist suggested that a credible/interesting person would enter the room, and we received a variety of responses. One high in the credible condition said he thought "That whatever he said, it happened – it's real", and another high in the interesting condition said "Maybe he was hypnotised himself". One low in the credible condition said "I remember thinking how she's going to tell me I'm a good person or something like that", and another low in the interesting condition wondered "How would I have to entertain him?" There was no indication that subjects were suspicious of the confederate.

### 3.2. Mirror folie à deux

#### 3.2.1. Passing mirror folie à deux

For mirror folie à deux, we indexed subjects' beliefs about the confederate's reflection (hereafter referred to as the 'Confederate's Reflection') as well as their beliefs about their own reflection (hereafter referred to as 'Own Reflection'). Subjects passed the Confederate's Reflection if they were unable to identify the confederate's reflection as the confederate. Subjects passed their Own Reflection if they were unable to identify their own reflection as themselves. Table 1 presents this data according to hypnotisability and status condition. Analyses initially compared the number of highs and lows who passed

**Table 1**  
Highs and lows who passed each delusion.

	Highs		Lows	
	Credible	Interesting	Credible	Interesting
Confederate's Reflection	6 (75%)	5 (63%)	0 (0%)	0 (0%)
Own Reflection	5 (83%)	0 (0%)	0 (0%)	0 (0%)
Jingle Bells	7 (78%)	3 (38%)	0 (0%)	1 (20%)

Note. Percentages are in parentheses.

the Confederate's Reflection irrespective of status condition. Chi-square analysis indicated that significantly more highs (11/17, 68.8%) than lows (0/10, 0.0%) passed,  $\chi^2(1, N = 26) = 11.92, p < .01$ . Since no lows passed, a subsequent chi-square analysis just for highs revealed no difference in pass rate across the two status conditions,  $\chi^2(1, N = 16) = 0.29, p = .59$ . In other words, two-thirds of highs adopted the delusion displayed by the confederate, irrespective of whether the confederate was credible or interesting.

In the postexperimental inquiry, subjects rated on a scale of 1–7 how much they believed that the confederate's reflection was a stranger (1 = “did not believe”, 7 = “completely believed”). Table 2 presents these ratings according to hypnotisability and status condition. A 2 (hypnotisability: high vs. low)  $\times$  2 (status condition: credible vs. interesting) analysis of variance (ANOVA) revealed a significant main effect of hypnotisability,  $F(1,22) = 4.28, p = .05$ . Although their ratings are moderate, highs believed that the confederate's reflection was a stranger ( $M = 2.88, SD = 2.09$ ) to a greater extent than lows ( $M = 1.40, SD = .70$ ). Postexperimentally, we asked subjects what they were thinking when the confederate displayed the delusion. Four lows (40.0%; 2 in credible; 2 in interesting) claimed that the confederate was acting, whereas, only one high (6.7%; 1 in interesting) reported this. One high in the credible condition said “I thought that somebody else was inside the room”, and another high in the interesting condition said “I did not believe at first but then I wanted to believe what he said”. Subjects rated on a scale of 1–7 how much they believed that the confederate believed he/she was seeing a stranger in the mirror (1 = “did not believe”, 7 = “completely believed”). A 2 (hypnotisability: high vs. low)  $\times$  2 (status condition: credible vs. interesting) ANOVA revealed a significant main effect of hypnotisability,  $F(1,22) = 5.93, p = .02$ . Highs believed that the confederate believed he/she was seeing a stranger in the mirror ( $M = 4.03, SD = 2.33$ ) to a greater extent than lows ( $M = 2.00, SD = 1.33$ ).

Of the 11 highs who passed the Confederate's Reflection, we tested 10 on their Own Reflection (one high initially passed the Confederate's Reflection but just before the test of their Own Reflection, claimed that it was a mirror and correctly identified the confederate). Five highs in the credible condition passed their Own Reflection (see Table 1), whereas no highs in the interesting condition did so,  $\chi^2(1, N = 10) = 6.67, p = .01$ . In other words, highs were more likely to see their own reflection as a stranger if they had been told that the confederate was credible and trustworthy, as opposed to interesting. In the postexperimental inquiry, we asked highs who were tested on their Own Reflection to rate on a scale of 1–7 how much they believed that their reflection in the mirror was a stranger (1 = “did not believe”, 7 = “completely believed”). These ratings are presented in Table 2. Once again, although the ratings are fairly modest, an independent-samples *t*-test revealed that highs in the credible status condition expressed much stronger belief that their own reflection had been a stranger than highs in the interesting status condition;  $t(8) = 3.10, p = .02$ .

### 3.2.2. Description of confederate's reflection

We asked subjects who passed the Confederate's Reflection questions about the “stranger”. These questions were semi-structured and were based on our previous research on mirrored-self misidentification (e.g., Barnier et al., 2008, 2011) as well as each subject's individual experience. Therefore, not all subjects were asked exactly the same questions. Percentages reported below are based on the total number of subjects who were asked each question.

**Table 2**  
Mean belief ratings.

	Highs		Lows	
	Credible	Interesting	Credible	Interesting
Confederate's Reflection	3.13 (2.48)	2.63 (1.77)	1.60 (0.89)	1.20 (0.45)
Own Reflection	4.00 (1.90)	1.00 (0.00)	N/A	N/A
Jingle Bells	4.00 (2.39)	2.88 (2.36)	1.80 (1.30)	1.40 (0.89)

Note. Standard deviations are in parentheses. Confederate's Reflection = To what extent did you believe that the confederate's reflection was a stranger (1 = “didn't believe it was a stranger”, 7 = “completely believed it was a stranger”)? Own Reflection = To what extent did you believe that your own reflection was a stranger (1 = “didn't believe it was a stranger”, 7 = “completely believed it was a stranger”)? Jingle Bells = To what extent did you believe that the people in the room next door were playing Jingle Bells (1 = “didn't believe there was music playing”, 7 = “completely believed there was music playing”)?



Seven highs (100.0%; 5 in credible; 2 in interesting) claimed that the stranger was completely unfamiliar and that they had never seen him/her before. Five highs (55.6%; 2 in credible; 3 in interesting) reported physical differences between the confederate and the stranger. For example, when the confederate asked “What do you think is different about them?” one high in the credible condition said: “The style that they are wearing. . . it’s very casual”. One high in the interesting condition said the stranger had “different eyes” and another high in the interesting condition said “his skin is fairer”. In addition to physical differences, eight highs (88.9%; 4 in credible; 4 in interesting) reported physical similarities between the confederate and the stranger. For example, one high in the credible condition said “They’ve got the same hair colour”. Another high in the credible condition said “Do you have a twin?” and yet another high in the credible condition said “They look like you, but. . . not you”. Three highs (30.0%; 2 in credible; 1 in interesting) generated explanations to account for the stranger’s presence. For example, one high in the credible condition said, “There’s a window there”. However, the majority of highs could not provide any explanation.

### 3.2.3. Description of own reflection

The five highs who passed their Own Reflection were asked questions about the “stranger” they saw instead of themselves. Again, questions were semi-structured and were based on previous research as well as each subject’s individual experience so not all subjects were asked exactly the same questions. All highs who were asked these questions were in the credible condition because no highs in the interesting condition passed their Own Reflection.

Three highs (100.0%) reported that the stranger was completely unfamiliar and that they had never seen him/her before. Three highs (100.0%) reported physical differences between themselves and the stranger. For example, when the confederate asked “How do they look different to you?” one high said “Shorter hair. They dye their hair”. Four highs (80.0%) also reported similarities between themselves and the stranger. For example, one high mentioned similarities including: “The hair colour, and I have a beanie like that”. Only one high gave an explanation to account for the presence of the stranger. This high reasoned that the first stranger they had seen instead of the confederate’s reflection had brought the stranger they were now seeing instead of their own reflection with him. So once again, highs had difficulty explaining the presence of (another) stranger.

We challenged highs by asking them to touch their nose while looking in the mirror. In response to this challenge, four highs (80.0%) maintained their delusion and reported that the stranger copied their actions. One high said “They are doing the same action as me” and another said “They followed me. They did the same”. The one high who did not maintain the delusion said “They copied . . . it’s got to be me . . . it’s me”, suggesting that this challenge appeared to break down her delusion.

### 3.2.4. Summary

More highs than lows were willing to adopt the confederate’s belief that the confederate’s reflection was a stranger. This is supported by highs’ postexperimental comments and ratings, which indicate a more compelling delusional experience than lows. Highs adopted the confederate’s belief irrespective of whether the confederate was credible or interesting. However, the status of the confederate influenced whether subjects saw their own reflection as a stranger. Only highs who had a credible confederate reported that their own reflection was also a stranger.

## 3.3. Auditory folie à deux

### 3.3.1. Passing auditory folie à deux

Subjects passed the auditory folie à deux suggestion if they reported hearing Jingle Bells coming from the room next door. **Table 1** presents this data according to hypnotisability and status condition. Analyses initially compared the number of highs and lows who passed. Chi-square analysis indicated that significantly more highs (10/17, 58.8%) than lows (1/10, 10.0%) passed,  $\chi^2(1, N = 27) = 6.22, p = .01$ . Highs reported clearly hearing Jingle Bells coming from the room next door. For example, one high in the credible condition said “I can really hear the bells”. Since only one low passed the auditory folie à deux suggestion, a subsequent chi-square analysis just for highs revealed no difference in pass rate across the two status conditions,  $\chi^2(1, N = 17) = 2.84, p = .09$ . In other words, highs were equally likely to hear Jingle Bells regardless of whether the confederate was credible or interesting. However, there was a trend for subjects in the credible condition (78%) to pass at a greater rate than subjects in the interesting condition (38%).

In the postexperimental inquiry, subjects rated on a scale of 1–7 how much they believed that Jingle Bells was being played next door (1 = “did not believe”, 7 = “completely believed”). **Table 2** presents these ratings according to hypnotisability and status condition. A 2 (hypnotisability: high vs. low)  $\times$  2 (status condition: credible vs. interesting) analysis of variance (ANOVA) revealed a significant main effect of hypnotisability,  $F(1, 22) = 5.14, p = .03$ . Once again, although their ratings are moderate, highs believed that the people in the room next door were playing Jingle Bells ( $M = 3.44, SD = 2.37$ ) to a greater extent than lows ( $M = 1.60, SD = 1.08$ ).

Postexperimentally, we asked subjects what they were thinking when the confederate told the hypnotist that they could hear Jingle Bells playing. Two lows (22.2%; 1 in credible, 1 in interesting) reported that the confederate was acting, whereas, no highs reported this. Highs gave a variety of responses. For example, one high in the interesting condition said “At first I thought, no there’s no music, and then I started to hear it [laughs] especially when she started to say that there was no singing, and just the tune, and yeah that’s when I started to hear it”. Subjects rated on a scale of 1–7 how much they believed that

the confederate believed there was music coming from the room next door (1 = “did not believe”, 7 = “completely believed”). A 2 (hypnotisability: high vs. low)  $\times$  2 (status condition: credible vs. interesting) ANOVA revealed a significant main effect of hypnotisability,  $F(1, 22) = 11.05, p < .01$ . Highs believed that the confederate believed there was music coming from the room next door ( $M = 4.56, SD = 2.13$ ) to a greater extent than lows ( $M = 2.00, SD = 1.41$ ).

### 3.3.2. Description of the music

Subjects who passed this suggestion were asked further questions about what they could hear. Since only one low passed this suggestion, analyses focus on highs who passed. Questions were semi-structured and based on each subject’s individual experience. As such, not all subjects were asked exactly the same questions. Percentages reported below are based on the total number of subjects who were asked each question.

Five highs (55.6%; 5 in credible; 0 in interesting) reported that the music they could hear was loud. For example, one high in the credible condition said, “It’s really loud” and another high in the credible condition said it was “Quite loud because I can hear it quite clearly”. Five highs (50.0%; 4 in credible; 1 in interesting) gave an explanation for why Jingle Bells would be playing. For example, one high in the credible condition said, “It’s their Christmas” and another high in the interesting condition said “Maybe because they think it’s Christmas”. Eight highs (80.0%; 6 in credible; 2 in interesting) could identify what side of the room the music was coming from. For example, one high in the credible condition said “Sounds like it is coming from behind me”, and another high in the interesting condition said “It’s coming from my right”.

### 3.3.3. Summary

More highs than lows were willing to adopt the confederate’s belief that the people in the room next door were playing Jingle Bells. This is supported by highs’ postexperimental comments and ratings that indicate a more compelling delusional experience than lows. There was a trend for highs who had a credible confederate to adopt this belief about Jingle Bells more so than highs who had an interesting confederate.

## 4. Discussion

The aim of this study was to use hypnosis to model the experience of the secondary in folie à deux. As predicted, and consistent with previous research using hypnosis to model delusions, many high hypnotisable subjects adopted the delusional beliefs displayed by the primary, whereas low hypnotisable subjects did not. Interestingly, only high hypnotisable subjects who had a credible confederate spread the delusion to encompass beliefs not originally expressed by the confederate. This study also demonstrated for the first time that high hypnotisable subjects will respond to “suggestions” from someone other than the hypnotist.

The percentage of subjects who passed both the mirror folie à deux (Confederate’s Reflection) (69%) and the auditory folie à deux (59%) were similar to pass rates observed in previous research that has used hypnosis to model delusions. For example, [Attewell et al. \(2012\)](#) reported pass rates of 79% among highs for hypnotic erotomania (the delusional belief that I am loved from afar by someone), [Barnier et al. \(2011\)](#) reported pass rates of 68% among highs for hypnotic mirrored-self misidentification, and [Rahmanovic et al. \(2012\)](#) reported pass rates of 54% among highs for hypnotic somatoparaphrenia (the delusional belief that one of my limbs belongs to someone else). Thus, we see similar pass rates across different hypnotic delusions even when there is no direct suggestion from the hypnotist. We also observed similarities across this experiment and previous research in the way that subjects responded to challenge. When a subset of subjects were asked to touch their nose while looking in the mirror, highs stated that the stranger was copying their actions. These subjects appeared to reinterpret conflicting information in a way that helped maintain their delusional belief. Similarly, [Connors, Barnier et al. \(2012\)](#), found that 76% of highs who received this challenge during hypnotically suggested mirrored-self misidentification also failed to recognise their reflection and continued to maintain their delusion. These types of reinterpretations also have been demonstrated in an hypnotic analogue of erotomania ([Attewell et al., 2012](#)), where subjects interpreted ambiguous scenarios in a way that supported their delusion.

Many highs embellished the beliefs expressed by the confederate with secondary confabulations. Secondary confabulations are commonly observed in both clinical delusions and experimental settings, and involve false or distorted statements that are used to justify or describe a delusional belief ([Fotopoulou, Conway, Griffiths, Birchall, & Tyrer, 2007](#); [Turner & Coltheart, 2010](#)). In the present study, highs made secondary confabulations in the mirror folie à deux item when they described physical differences between the confederate and the stranger, and between themselves and the stranger. They also made secondary confabulations in the auditory folie à deux item when they described the side of the room where Jingle Bells originated, or claimed that they could hear people singing along.

In the folie à deux literature, the primary is typically perceived by the secondary to be a credible and trustworthy individual ([Sacks, 1988](#)). For this reason, we hypothesised that highs would adopt the beliefs of a “credible” primary to a greater extent than an “interesting” primary. Indeed, the credible primary did appear to be more successful in transmitting these delusions. For the auditory suggestion, highs tended to adopt the beliefs of a credible primary more than an interesting primary ( $p = .09$ ). Also, only highs who had a credible confederate saw their own reflection as a stranger. This is especially interesting given that the confederate did not make any comments about the subject’s reflection and did not imply that it should also be a stranger. Rather, subjects elaborated upon the original delusion to include their own reflection. Although surprising,

this is consistent with [Lasègue and Falret's \(1877\)](#) original description of folie à deux, where it was noted that secondaries elaborated on the induced delusion.

#### 4.1. Theoretical implications

According to [Langdon and Coltheart's \(2000\)](#) two-factor theory of delusions, Factor 1 is responsible for the content of delusions and Factor 2 is responsible for the maintenance of delusions. Until recently, the two-factor theory has focused on “endogenous” (internally driven) processes in delusion formation ([Langdon, 2013](#)). In other words, both Factor 1 and Factor 2 were first described by [Langdon and Coltheart \(2000\)](#) as originating from neurological impairments (e.g., impaired face processing following a stroke) or motivational processes (e.g., attentional or information processing biases). However, endogenous processes alone cannot always explain the delusional beliefs held by the secondary in folie à deux ([Langdon, 2013](#)). Recently, [Langdon \(2013\)](#) suggested that the two-factor theory might be extended to consider more “exogenous” (externally driven) processes. In this way, the primary could be an exogenous source for Factor 1 in the secondary. Our hypnotic model of folie à deux is consistent with this extension of the two-factor theory. We focused on the experience of the secondary, for whom Factor 1 was provided by communication with the primary. Within [Langdon's \(2013\)](#) extension of the two-factor theory, the specific circumstances where Factor 1 can be exogenous are yet to be defined. It may only be possible in cases where there is an existing Factor 2-like deficit as seen in many secondaries in folie à deux. Interestingly, the current study indicates that the hypnotic context itself might also be producing an existing Factor 2-like deficit by disrupting normal belief evaluation.

One way to confirm whether the hypnotic context is indeed playing the role of Factor 2 is to implement a design where high and low hypnotisable subjects receive suggestions either with or without hypnosis ([Cox & Bryant, 2008](#)). In work on hypnotic mirrored-self misidentification, [Connors, Barnier et al. \(2012\)](#) found that only highs who received suggestions in hypnosis developed the complete delusion. In contrast, highs who received suggestions without hypnosis did not. Future work can apply this design to a hypnotic model of folie à deux to provide firmer evidence about the role of the hypnotic context in this particular delusion.

#### 4.2. Social demands

This study provides the first demonstration of a hypnotised subject responding to suggestions that did not come from the hypnotist. In fact, no direct suggestions were given to hypnotised subjects at all. They simply witnessed another individual demonstrating a delusional belief (also not suggested by the hypnotist) and were subsequently asked if they agreed with this belief. It appears that hypnotisability and the hypnotic context were the important factors in determining response to this suggestion rather than the communications of the hypnotist.

Although the majority of low hypnotisable subjects did not adopt the beliefs of the confederate, one low did agree that the people in the room next door were playing Jingle Bells. In any hypnotic setting, there are contextual, motivational, and social factors influencing subjects' behaviour, which may account for why this low hypnotisable subject adopted the Jingle Bells delusion. This experiment in particular involved strong social demands from the confederate for subjects to agree with their beliefs. However, despite these strong social demands, lows rarely adopted the beliefs of the confederate. This implies that the delusion was not simply adopted due to social contagion, compliance, or social demands alone. Rather, hypnotic ability seemed to be critical for determining who would adopt the confederate's beliefs. Importantly, in clinical cases there are likely to be even stronger demands from the primary as they attempt to convince the secondary of their belief.

To examine the issue of social demands, future research could apply [Orne's \(1962, 1971\)](#) real-simulating paradigm of hypnosis. This paradigm compares the performance of highs who are hypnotised (“reals”) with lows who have been told to fake hypnosis (“simulators”). Simulators are a quasi-control condition as their responses are an indication of the demand characteristics of the hypnotic setting. If reals and simulators respond similarly, there is a possibility that reals' responses are due to demand characteristics. However, if their responses differ, it can be inferred that reals' responses are not due to social cues alone ([Cox & Bryant, 2008](#)). In previous research we have applied the real-simulating paradigm to a hypnotic model of identity delusions ([Cox & Barnier, 2013](#)). Here, we gave reals and simulators a hypnotic suggestion to become a friend's sibling and then asked them to recall autobiographical memories. We found that more reals than simulators maintained their identity delusion when challenged and more reals than simulators recalled specific autobiographical memories consistent with the suggested delusion. This suggests that for reals, the hypnotic identity delusion could not be solely attributed to experimental demands but rather, reflected a compelling delusional experience.

#### 4.3. Future directions

Although this experiment focused on the experiences of the secondary, it represents the first stage of developing a complete analogue of folie à deux. To create a full analogue, and an even closer match to clinical folie à deux, future research might use a hypnotised high as the primary. This would be valuable in terms of seeing what the primary would say and do to convince the secondary of their delusional belief. Such information is usually not available in clinical cases since patients typically present to clinicians long after their delusion has been established. An advantage of using hypnosis to model delusions is being witness to the development of the delusion from its “birth”. We also could examine whether the second-

ary abandons their delusion when separated from the primary/confederate, as seen in many clinical cases. A better understanding of the circumstances in which such delusions are abandoned may provide clues about how best to treat patients.

It is worthwhile also considering the types of evidence that subjects might use to evaluate the beliefs of the primary. The two delusions used in the present study could both be refuted by evidence from subjects' senses. Subjects had access to visual and auditory evidence that could be used to contradict the beliefs expressed by the confederate. In some cases of folie à deux, the primary may convince the secondary of delusions that cannot be proven or disproven via the senses (Nielsen et al., 2012). For example, in one clinical case a woman convinced her husband that she could hear the voice of God and that this voice was telling her that their child was possessed by a demon (Nielsen et al., 2012). In this case, the husband could not verify his wife's claims with evidence from his own senses yet he nevertheless adopted her delusion. For the successful transmission of these types of delusions, the credibility of the confederate may play a greater role. If the secondary cannot test the primary's claims with their own senses, they may rely more on the primary's credibility in deciding whether to adopt their belief. In fact, rather than simply saying that the confederate is credible, future research could provide additional information about the confederate or have the confederate behave in particular ways, so that they are perceived as more or less credible.

#### 4.4. Conclusion

In this first attempt at modelling folie à deux, we found that a confederate successfully transmitted two delusional beliefs to many high hypnotisable subjects. We demonstrated that hypnotised subjects are capable of responding to suggestions that do not come directly from the hypnotist. Subjects with a "credible" confederate appeared to adopt the delusions more readily than subjects with an "interesting" confederate. Only those who interacted with a "credible" confederate elaborated upon and extended these false beliefs. This study may help to refine Langdon's (2013) proposed extension to the two-factor theory by informing our understanding of the factors that contribute to folie à deux, especially in secondaries. Finally, this work adds to a growing body of literature (Kihlstrom, 1979) that demonstrates that hypnosis remains a valuable technique for investigating clinical conditions in the laboratory.

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