Australasian Journal of Philosophy

ISSN: 0004-8402 (Print) 1471-6828 (Online) Journal homepage: www.tandfonline.com/journals/rajp20

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To cite this article: David Rose, Wesley Buckwalter & John Turri (2014) When Words Speak Louder than Actions: Delusion, Belief, and the Power of Assertion, Australasian Journal of Philosophy, 92:4, 683-700, DOI: 10.1080/00048402.2014.909859

To link to this article: https://doi.org/10.1080/00048402.2014.909859

Australasian Journal of Philosophy, 2014
Vol. 92, No. 4, 683–700, http://dx.doi.org/10.1080/00048402.2014.909859

Routledge
Taylor & Francis Group

WHEN WORDS SPEAK LOUDER THAN ACTIONS: DELUSION, BELIEF, AND THE POWER OF ASSERTION

David Rose, Wesley Buckwalter and John Turri

People suffering from severe monothematic delusions, such as Capgras, Fregoli, or Cotard patients, regularly assert extraordinary and unlikely things. For example, some say that their loved ones have been replaced by impostors. A popular view in philosophy and cognitive science is that such monothematic delusions aren't beliefs because they don't guide behaviour and affect in the way that beliefs do. Or, if they are beliefs, they are somehow anomalous, atypical, or marginal beliefs. We present evidence from five studies that folk psychology unambiguously views monothematic delusions as stereotypical beliefs. This calls into question widespread assumptions in the professional literature about belief's stereotypical functional profile. We also show that folk psychology views delusional patients as holding contradictory beliefs. And we show that frequent assertion is a powerful cue to belief ascription, more powerful than even a robust and consistent track record of non-verbal behaviour.

Keywords: delusion, belief, folk psychology, assertion

1. A Question of Attitude: Are Delusions Beliefs?

In their work on clinical subjects, Hirstein and Ramachandran [1997] present the case of a patient named DS. DS was a middle-aged man who suffered a traumatic brain injury in a gruesome traffic accident. In the year following his injury he began what appeared to be a remarkable and speedy recovery. DS regained his powers of speech and intelligence, as well as nearly all his cognitive and social skills. However, there was something very strange about DS after his accident. He would regularly tell his doctors, family, and friends that his parents had been replaced by impostors.

DS was later diagnosed with a condition called Capgras Syndrome, a rare neurological disorder where patients suffer the delusion that someone close to them—such as a loved one, family member, or friend—has been replaced by a duplicate or impostor. Typical of Capgras patients, when others confront DS with putative evidence that his parents are not actually impostors, his assertions to the contrary persist.[1] In the words of DS, when interviewed by Hirstein and Ramachandran, 'He looks exactly like my father but he really isn't. He's a nice guy, but he isn't my father, Doctor' [438].

[1]This work corroborates earlier findings by Alexander, Stuss, and Benson [1979: 335] showing that patients may continue to hold such attitudes while simultaneously appreciating the implausibility of the story and the incredulity of others.

As is also typical of patients with Capgras Syndrome, despite DS's assertions, he doesn't exhibit the stereotypical non-verbal behaviours we would normally expect if he believed that these people are impostors. Capgras patients typically continue to share their lives with the purported impostors. The presence of these 'intruders' is not typically reported to the police. Nor does the syndrome typically lead to flight or violent outbursts of behaviour.

These striking features of Capgras syndrome raise an interesting question: what does DS believe about his parents? On the one hand, DS regularly says that impostors have replaced his parents. On the basis of his verbal behaviour, you might naturally conclude that DS believes that his parents are impostors. On the other hand, there is DS's wider range of non-verbal behaviour, which doesn't cohere with what he says about his parents being replaced. He does not run away from these impostors; he does not call the police; he does not seek out lost loved ones. On the basis of these non-verbal behaviours, you might naturally conclude that DS believes his parents are really who they say they are.

Of course this raises an obvious question: what are these attitudes, then? Some say they belong to some other familiar folk-psychological categories, such as imagination [Currie 2000; Currie and Jureidini 2001; Currie and Ravenscroft 2002], pretense [Gendler 2007], or illusion [Hohwy and Rajan 2012]. Others argue that no familiar folk-psychological category fits the bill, which motivates them to invent new categories, such as 'bimagination' [Egan 2009], a hybrid of belief and imagination that incorporates stereotypical elements of both. And even those who defend the 'doxasticist' view that delusional attitudes are beliefs say that delusions are 'anomalous' beliefs [Bortolotti 2012; Bortolotti and Mameli 2012], or that they are beliefs in some contexts but not others [Reimer 2010]. Still others hold that they aren't 'fully' beliefs because they don't 'fully meet any relevant folk-psychological stereotype' for belief [Tumulty 2012: 30 n.2; see also Schwitzgebel 2001; 2011].

Note well that even those who defend the view that delusions are (at least partly) beliefs agree that these attitudes 'deviate' from 'the causal-functional patterns in behaviour and cognition characteristic of belief', in which case 'the assumptions inherent in the practice of belief ascription start to break down'. We're then left with a choice: 'either abandon belief talk or allow for some indeterminacy in it' [Schwitzgebel 2011: 16].

We question the widespread assumption that delusional attitudes, such as DS's, are not viewed straightforwardly as beliefs [see, e.g., Bortolotti 2012; Bortolotti and Mameli 2012; Frankish 2012; Murphy 2012; Egan 2009; Schwitzgebel 2001; 2011; Tumulty 2012]. Instead of casting about for categories other than belief in which to place such attitudes, or gerrymandering new categories, or offering elaborate theoretical defenses for categorizing them as beliefs, we propose a disarmingly simple and unsophisticated thesis: in cases like DS's, the delusional attitudes are stereotypical beliefs. There is no need to innovate, compromise, or apologize. Furthermore, we embrace a corollary of this thesis, namely, that theorists should revise their views about stereotypical belief. Philosophers of mind and cognitive scientists have strayed very far indeed from the folk psychology of belief.

This paper presents experimental evidence supporting our thesis and its corollary. More specifically, we accomplish three main things. First, using different measures, we show that the folk readily classify Capgras delusions as beliefs. Second, we show that people view these delusions as beliefs because frequent assertion is a powerful cue to belief ascription. In folk psychology, frequent assertion just is a behavioural pattern stereotypical of belief. Third, delusional patients are readily viewed as holding contradictory beliefs, which can explain the ambivalence we feel when considering such cases.

Before presenting our studies, we want to dispel any appearance that our thesis is somehow radical or revisionary and, thus, that we bear an especially demanding burden of proof. We think that belief is the natural first candidate for categorizing delusions. In fact, clinical psychologists and psychiatrists define delusions as beliefs. The DSM-IV [American Psychiatric Association 2000: 765] defines 'delusion' as this:

> A false belief based on incorrect inference about external reality that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary.

There is much to criticize in this definition. First, it can't be definitive of delusions that they are false. Second, it can't be definitive of delusions that they are inferential. Third, it can't be definitive of delusion that it be subject to incontrovertible counterevidence.[2] However, although we're aware of this definition's serious deficiencies, we don't think its basic motivation is deficient. Instead, we think it's on the right track. We doubt it's an accident that professionals who deal most closely with delusional patients choose to define delusion as belief.[3] As we will now proceed to argue, philosophers and cognitive scientists tempted to characterize delusional attitudes as beliefs have been right from the start.

Although we present evidence that folk psychology readily characterizes delusional attitudes as beliefs, things could have turned out otherwise. It could have turned out that the folk readily deny or are ambivalent about ascribing beliefs to delusional subjects. Had it turned out that way, it would have provided strong evidence that philosophers and cognitive scientists were right to deny that delusional attitudes are viewed as beliefs, or at least as clear cases of belief.

2. Experiment 1: Robust Belief Ascription to Capgras patients

This first experiment provides evidence that people view Capgras delusions as beliefs. It also provides evidence that significant behavioural circumscription is consistent with the profile of stereotypical belief.

[2]For extended criticism of the DSM-IV definition of delusions, see Coltheart [2007].
[3]For notable exceptions, see Jaspers [1963], and more recently, Parnas [2004], Cermolacce, Sass, and Parnas [2010].

Method

Participants (N = 121)[4] were randomly assigned to one of six conditions in a 2 (Action Profile: Typical, Atypical) × 2 (Probe: Thinks, Believes) between-subjects design. All participants read a basic story describing a typical case of Capgras syndrome:

> Don and Katherine had been married for ten years. Like most married couples, they spent a lot of time together and did many things together. They regularly shared meals, went to the movies, lived in the same house, and slept in the same bed. Then one day, as Don was driving to the store, a car ran a stop-light, hitting the driver side door of his car. Don suffered a traumatic brain injury as the result of the gruesome traffic accident.¶[5] In the year following his injury, he began what appeared to be a remarkable and speedy recovery. Don regained his powers of speech, intelligence, as well as nearly all his cognitive and social skills. However there was something very strange about Don after his accident: he would tell his friends, family and doctors that his wife, Katherine, had been replaced by an impostor. ¶

Participants in Typical conditions read a conclusion to the story in which the protagonist, in typical Capgras fashion, continued to treat his partner as he did before his accident and as partners typically treat one another:

> *Typical*. Katherine was very surprised and saddened by the things Don would say. At the same time, Don continued to always eat meals with her, go to the movies with her, live in the same house as her, and sleep in the same bed as her.

Participants in Atypical conditions read a conclusion to the story in which the protagonist treats his partner as we might expect him to treat an impostor and intruder:

> *Atypical*. Katherine was very surprised and saddened by the things Don would say. At the same time, Don now always refused to eat meals with her, go to the movies with her, live in the same house as her, and sleep in the same bed as her.

We included the Typical/Atypical manipulation in order to determine whether the delusion's behavioural circumscription affects rates of belief ascription. That is, we wanted to know whether people's view of the case changes when the protagonist goes from not acting in a way that coheres with the delusion's content, to acting in a way that coheres with it. The typical Capgras patient does not act consistently with the delusion's content, but unless we manipulate this factor, we can't be confident how behavioural

[4]Forty-one female, aged 18-71, M = 30.19, SD = 10.78; 93% reported English as a native language. As with all the experiments reported below, participants were U.S. residents recruited using Amazon Mechanical Turk, tested online using Qualtrics survey software, and compensated $0.30 for approximately 2 minutes of their time. Participants were not allowed to re-take any survey reported here, and participants who had taken previous similar surveys were excluded by their AMT Worker ID. They filled out a brief demographic survey after testing. Four participants were removed for failing the comprehension question. Including these participants doesn't change the pattern of results reported below. The same is true in all other studies reported here.
[5]¶ indicates a paragraph break on the participant's screen.

circumscription affects the way people view the case. It is almost universally assumed in the literature that behavioural circumscription counts against classifying delusion as a belief. Will this assumption withstand empirical scrutiny?

After reading the story, all participants were asked a comprehension question to make sure they understood the protagonist's behavioural profile:

> *Comprehension*. After the accident, Don eats, sleeps, and spends time with Katherine.

Prior work in experimental philosophy and cognitive science has demonstrated two ways to effectively probe belief judgments in folk psychology, the first by asking what a participant 'believes is true', the other, what a participant 'thinks on some level is true' [Rose and Schaffer 2013; Buckwalter, Rose, and Turri 2013; Buckwalter and Turri 2014]. Moreover, predominant experimental work in developmental psychology, including for instance, most studies conducted on the false belief task, evaluate belief ascription by asking what a participant 'thinks' is true [e.g., Wimmer and Perner 1983; Roth and Leslie 1991]. Guided by this prior research probing belief in folk-psychology, and in order to ensure that our results were not due to peculiarities associated with any one way of probing for belief ascription, participants were asked one of two questions. Participants in Believes conditions were asked about what the protagonist believes. Participants in Thinks conditions were asked about what the protagonist thinks. The two probes were:

> *Believes*. Does Don believe that Katherine is an impostor? [Yes/No]
>
> *Thinks*. At least on some level, does Don think that Katherine is an impostor? [Yes/No]

Results

We're interested in two questions. First, does folk psychology recognize monothematic delusions of Capgras patients as stereotypical beliefs? If folk psychology does not recognize Capgras delusions as stereotypical beliefs, then we should not observe high rates of belief ascription. Instead, rates should be either low or at chance. If this is the case, then this would support the view that Capgras delusions are not instances of stereotypical belief. By contrast, if rates of belief ascription are high, then that supports the view that folk psychology recognizes Capgras delusions as stereotypical beliefs. Second, does behavioural circumscription significantly affect whether Capgras delusions are viewed as beliefs? If it does, then we should observe significantly lower rates of belief ascription in Typical cases than in Atypical cases. And if this were the case, it would go some way toward supporting an account of why cases of Capgras delusion are not instances of stereotypical belief.

The results clearly answer both questions. First, rates of belief ascription were at or near ceiling in all four conditions. On both ways of probing for belief and regardless of behavioural circumscription, participants ascribe

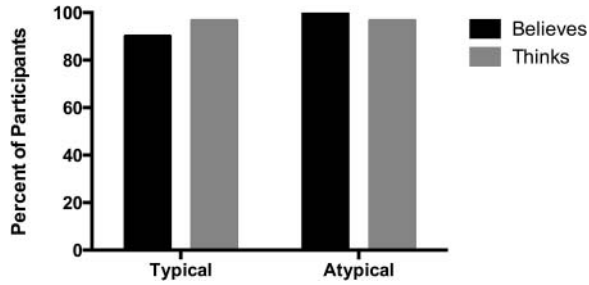

Fig 1. Experiment 1. Mean response to the test statement that the protagonist 'thinks' or 'believes' that Katherine is an impostor.

belief at rates far exceeding chance: 90–100%, binomial tests, all ps $\leq$ .0005, all tests two-tailed unless otherwise noted. Capgras delusions are viewed as stereotypical beliefs.

Second, there was no effect of Action Profile, either for Believes conditions, Fisher's exact test, p = .237, or Thinks conditions, Fisher's exact test, p = 1.[6] The severe behavioural circumscription in Typical conditions did not prevent people from overwhelmingly agreeing that Capgras delusions are beliefs. Surprisingly, and against conventional wisdom, behavioural circumscription had no effect on whether the folk viewed the Capgras patient as having the belief that his wife is an impostor. Figure 1 visualizes these results.

Discussion

Belief was nearly unanimously ascribed despite significant behavioural circumscription in Capgras cases. Had participants failed to unanimously ascribe belief, or had significant behavioural circumscription affected ordinary judgments, this would have supported the claim that delusional attitude is not best characterized in terms of stereotypical belief. However, our results suggest that folk psychology recognizes cases of monothematic delusion as clear and uncontroversial instances of belief. The question we are now faced with is that of *why* folk psychology treats monothematic delusions in this way. We take this up in the experiments that follow.

3. Experiment 2: Assertion and Contradiction

Some writers have speculated that a Capgras patient's willingness to assert the delusional content is '*prima facie* evidence for supposing that' they believe the delusional content [Reimer 2010: 325–6]. Moreover, it has recently been shown experimentally that, on some ways of measuring belief ascription, belief ascription rises dramatically when the protagonist verbally

[6]Fisher's exact test is a statistical significance test that is used for categorical data. It is primarily employed when the count within cells in a contingency table is less than 5. When cells in a contingency table are greater than or equal to 5 and the sample size is decently large, a chi-square (χ^2) is appropriate [see e.g., fn. 12].

endorses a target proposition [Buckwalter, Rose, and Turri 2013]. Indeed, this work has suggested that assertion can make the difference between attributing and denying belief.

Some writers have also speculated that there might be significant continuity between cases of self-deception and delusions [e.g., Bortolotti and Mameli 2012], while others have denied that there is any significant continuity [e.g., Murphy 2012]. On a standard view of self-deception [e.g., Davidson 1982; 1986], the self-deceived agent possesses two contradictory beliefs that are compartmentalized or partitioned. If this characterization of self-deception is correct and if one suspects that there is considerable overlap between cases of self-deception and delusion, then could it be that delusional patients are viewed as holding contradictory beliefs? For instance, could it be that Don both believes that Katherine is his wife and believes that Katherine is an impostor? Ascribing contradictory beliefs to people feels uncharitable, and this could explain why many theorists have sought to avoid classifying delusions as beliefs.

This experiment pursues both of these speculations at once. On the one hand, we investigate whether the frequency of the Capgras patient's assertion affects whether people ascribe belief to him. On the other hand, we investigate whether Capgras patients are viewed as having contradictory beliefs.

Method

Participants (N = 202)[7] were randomly assigned to one of eight conditions in a 2 (Proposition: Imposter, Wife) × 2 (Probe: Believes, Thinks) between-subjects design. All participants read a single story similar to the one used in Experiment 1.

The Frequency manipulation varied whether the protagonist asserted the delusional content regularly or only once in the story:

> [*Frequent*/*Infrequent*]. Don and Katherine had been married for years. Like most married couples, they spent a lot of time together. They regularly shared meals, went to the movies, lived in the same house, and slept in the same bed. Then one day, as Don was driving to the store, a truck ran a stop-light and smashed into Don's car. Don suffered a traumatic brain injury in the accident. ¶ In the year following his injury, Don began a remarkable and speedy recovery. He regained his powers of speech, intelligence, and nearly all of his cognitive and social skills. One time, about a year after the accident, Don said to Katherine, 'You are not my real wife. You are an impostor.' [And that was the only time he said that. From then on, he never said it again./ But that was not the only time he said that. From then on, he said it every day.] ¶ All the while, Don continued to always eat meals with Katherine, go to the movies her, live in the same house as her, and sleep in the same bed as her.

The Proposition factor manipulated which proposition we asked participants to focus on when ascribing belief to Don. Participants in Impostor

[7]Fifty-five female, aged 18–59 years, M = 28.06, SD = 7.47; 98% reported English as a native language.

conditions were asked whether Don believes that Katherine is an impostor. Participants in Wife conditions were asked whether Don believes that Katherine is his wife. The purpose of this manipulation is to determine whether Capgras patients are readily viewed as having contradictory beliefs.

The Probe manipulation is similar to the one in Experiment 1. Participants in Believes conditions were asked to rate their agreement with the statement that Don 'believes' a certain proposition is true. Participants in Thinks conditions were asked to rate their agreement with the statement that Don 'thinks' a certain proposition is true. The motivation for this manipulation is two-fold. First, as already mentioned, prior results showed that when a protagonist verbally endorses a proposition, the effect on belief ascription can depend on how one probes for belief-ascription. Second, and relatedly, we again wanted to ensure that our results were not due to peculiarities associated with any one way of probing for belief-ascription.

Responses were collected on a standard 7-point Likert scale, anchored with 'Strongly Disagree', 'Disagree', 'Somewhat Disagree', 'Neutral', 'Somewhat Agree', 'Agree', and 'Strongly Agree', left-to-right on the participant's screen, and coded '-3' through '3' for purposes of statistical analysis, creating a neutral midpoint of '0'. (Participants never saw the numerical values, only the qualitative anchors.)

Results

An analysis of variance revealed a large-sized effect of condition on belief ascription, $F(7, 194) = 7.96$, $p < .000001$, $\eta p^2 = .223$.[8] There was a small-sized effect of Probe, with the 'thinks' probe eliciting higher ascription than the 'believes' probe ($M = 0.94/0.36$, $SD = 1.41/1.96$), $F(1, 194) = 7.97$, $p = .005$, $\eta p^2 = .039$. There was a large-sized interaction of Frequency and Proposition, whereby the switch from Infrequent to Frequent raised rates of belief ascription in Impostor conditions but lowered them in Wife conditions, $F(1, 194) = 40.81$, $p < .000001$, $\eta p^2 = .174$. There was also a marginal small-sized main effect of Frequency, $F(1, 914) = 3.61$, $p = .059$, $\eta p^2 = .018$, and a marginal small-sized three-way interaction among Probe, Frequency, and Proposition, $F(1) = 2.985$, $p = 0.086$, $\eta p^2 = .015$. Figure 2 visualizes these results.

We call attention to a range of relevant aspects of these results. First, when Don asserts only once that Katherine is an impostor, on neither way of probing do participants ascribe to him the belief that Katherine is an impostor. One-sample t-tests show that the mean response to the 'thinks' probe didn't differ significantly from the neutral midpoint ($M = 0.19$, $SD = 1.67$), $t(25) = 0.586$, $p = .563$. By contrast, the mean response to the 'believes' probe was significantly below the midpoint, indicating the people

[8]Partial-eta squared (ηp^2) is an effect size measure which indicates the amount of variance in a given dependent variable explained by a candidate independent variable. This measure delivers a value between 0 and 1. In interpreting ηp^2 we follow Ellis [2010]. Thus, values greater than or equal to .14 are large, greater than or equal to .06 but less than .14 are medium, and greater than or equal to .01 but less than .06 are small.

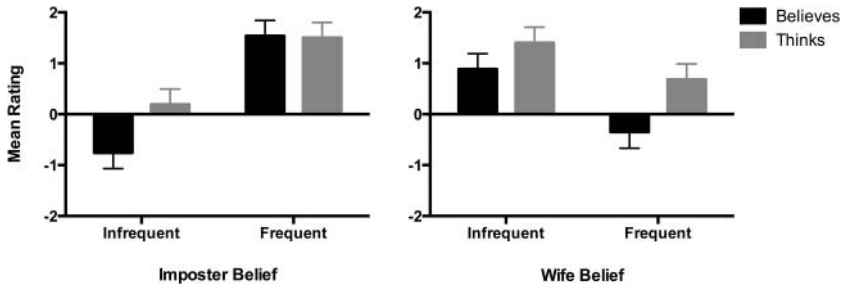

Fig 2. Experiment 2. Mean belief ascription for the impostor belief (left) and wife belief (right) grouped by infrequent or frequent assertion. All scales ran (-3) to (+3). Error bars + one standard error of the mean.

tend to deny that Don believes that Katherine is an impostor ($M = -0.76$, $SD = 1.54$), $t(24) = -2.475$, $p = .021$.

Second, when Don asserts only once that Katherine is an impostor, on both ways of probing, participants ascribe to him the belief that Katherine is his wife: 'thinks' ($M = 1.40$, $SD = 0.957$), $t(24) = 7.311$, $p < .000001$; 'believes' ($M = 0.88$, $SD = 1.728$), $t(25) = 2.610$, $p = .015$.

Third, when Don asserts every day that Katherine is an impostor, on both ways of probing participants ascribe to him the belief that Katherine is an impostor: 'thinks' ($M = 1.50$, $SD = 1.105$), $t(25) = 6.925$, $p < .000001$; 'believes' ($M = 1.54$, $SD = 1.334$), $t(25) = 5.882$, $p < .00001$.

Fourth, when Don asserts every day that Katherine is an impostor, the 'thinks' and 'believes' probes elicit significantly different responses in Wife conditions. When asked whether they agree that Don thinks that Katherine is his wife, the mean response is significantly above the neutral midpoint ($M = 0.68$, $SD = 1.406$), $t(24) = 2.418$, $p = .024$. By contrast, when asked whether they agree that Don believes that Katherine is his wife, the mean response is below the midpoint, though not significantly so ($M = -0.35$), $t(22) = -0.723$, $p = .477$.

On the ordinary way of evaluating the case, then, we may conclude the following about Don's case. In the light of Don's isolated assertion that Katherine is an impostor:

- it's unclear whether he thinks that she is an impostor;
- he doesn't believe that she is an impostor;
- he definitely thinks that she is his wife; and
- he believes that she is his wife.

By contrast, in the light of Don's daily assertions that Katherine is an impostor:

- he definitely thinks that she is an impostor;
- he definitely believes that she is an impostor;

- he thinks that she is his wife; but
- it's unclear whether he believes that she is his wife.

Fifth, and most importantly, it follows from what we've already said that people tend to ascribe contradictory attitudes to a prototypical Capgras patient. More specifically, when Don regularly asserts that Katherine is an impostor, people agree both that he thinks that Katherine is an impostor and that he thinks that Katherine is his wife.

Sixth, compounding the fact that people tend to agree that Don thinks contradictory claims are true, they also view Don as 'thinking' something is true without also 'believing' it. More specifically, they view him as thinking it's true that Katherine is his wife, but they do not view him as believing that she is his wife. In light of this serious compound tension, it's perfectly understandable that some theorists would consider revising aspects of the ordinary ways of viewing such cases. In particular, it's understandable that they would consider denying that Don thinks that both of these things are true, and then pick one of them to reject. Ironically, however, these theorists end up rejecting that Don thinks Katherine is an impostor, whereas ordinarily people think it's much clearer that Don thinks she is an impostor than that he thinks she's his wife.

Seventh, the results in Frequent conditions demonstrate the surprising power that assertion has in eliciting belief ascription. Consider all the non-verbal behaviour which is well explained by ascribing to Don the belief that Katherine is his wife: he always eats meals with her, goes out with her, lives with her, and sleeps in the same bed as her. When it comes to eliciting belief ascription, this persistent and robust profile of non-verbal behaviour pales in comparison to the power of circumscribed but consistent verbal behaviour. All Don has to do is to say daily, 'You are an impostor,' and people overwhelmingly ascribe to him the relevant belief. Despite the old adage, 'Actions speak louder than words,' when it comes to belief, it seems that words can sometimes speak far louder than actions. To swap one adage for another, in evaluating what others believe, 'the tongue is mightier than the sword.'

Finally, the pattern of results suggests that if you 'believe' that something is true, then you 'think' that it is true. But the converse does not hold: if you 'think' that something is true, it's still an open question whether you also 'believe' that it is true. This replicates and generalizes previous findings, in which the 'thinks' probe elicited significantly higher rates of ascription than the 'believes' probe [Buckwalter, Rose, and Turri 2013; Buckwalter and Turri 2014].

Discussion

The results from this experiment support two main conclusions. First, the frequency of a Capgras patient's assertion affects whether people ascribe belief to him. Second, Capgras patients are viewed as having contradictory beliefs.

4. Experiment 3: Strength from Within

The results from Experiment 2 suggest an explanation for why folk psychology recognizes cases of Capgras delusion as instances of stereotypical belief: frequent assertion is a powerful cue to belief ascription. That is, a pattern of frequent assertion is stereotypically associated with belief. Experiment 2 also provided support for the claim that, on the ordinary way of viewing matters, paradigmatic Capgras patients have contradictory beliefs. Participants tended to view Don as both thinking that Katherine is his wife and thinking that she is an impostor. However, we used a between-subjects design, so no one participant ascribed both of those beliefs to Don. Even better evidence for a tendency toward contradictory ascription would come from individual participants ascribing both beliefs together, as opposed to different groups of participants ascribing each belief separately. This experiment follows up on this suggestion.

Method

Participants ($N = 55$)[9] were randomly assigned to one of two groups, Believes and Thinks. All participants read the Frequent story from Experiment 2 (i.e. the prototypical Capgras case where Don frequently asserts that Katherine is an impostor). The between-subjects factor was the probe used; it was the same probe manipulation used in Experiments 1 and 2. The within-subjects factor was that all participants were asked to rate their agreement with both of the relevant statements, namely, that Don believes/thinks Katherine is his wife, and that Don believes/thinks Katherine is an impostor. Otherwise, the procedure was the same as in Experiment 2.

Results

The main question is whether participants would continue to ascribe contradictory beliefs to Don. It turns out that they did. In the Thinks condition, mean agreement with both ascriptions was significantly above the neutral midpoint: Wife ($M = 0.70$, $SD = 1.35$), $t(26) = 2.702$, $p = .012$; Impostor ($M = 1.63$, $SD = 1.33$), $t(26) = 6.346$, $p < .00001$. In the Believes condition, mean agreement with the Impostor ascription was significantly above the neutral midpoint ($M = 0.96$, $SD = 1.89$), $t(27) = 2.693$, $p = .012$, whereas mean agreement with the Wife ascription was non-significantly below the midpoint ($M = -0.50$, $SD = 1.89$), $t(27) = -1.396$, $p = .174$. Figure 3 visualizes these results.

Discussion

Even when using a within-subjects design, we continue to find that participants attribute the belief to Don that his wife is an impostor. And,

[9]Twenty female, aged 18-60, $M = 31$, $SD = 10.15$; 91% reported English as a native language.

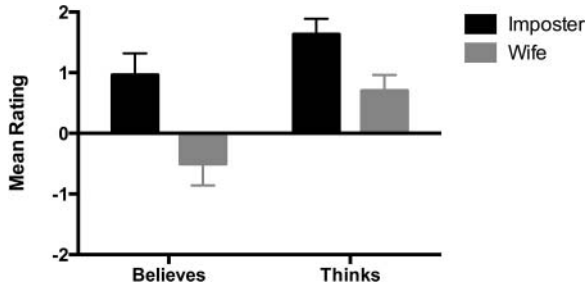

Fig 3. Experiment 3. Mean impostor and wife belief ratings grouped by the two belief probes presented within-subjects to each participant. All scales ran (−3) to (+3). Error bars + one standard error of the mean.

importantly, we continue to find that people—indeed *the same individuals*—are willing to ascribe contradictory attitudes to Don, namely, that he both thinks that Katherine is an impostor and thinks that she is his wife.

5. Experiment 4: A Figment of Imagination?

Experiments 1–3 provided evidence that folk psychology recognizes cases of monothematic delusions as stereotypical beliefs. But at least two objections arise at this point. The first objection is that at least some participants might be ascribing belief due to pragmatic pressures associated with principles of charity rather than features stereotypically associated with belief. That is, they might answer that Don believes (thinks) that Katherine is an impostor because they think he *should* believe this. The second objection is that at least some of the belief ascription we observed was an artifact of the way we questioned participants. Some participants might ascribe belief because it's the best available option, not because they really accept that Don believes that the claim in question is true. In all of our studies, we asked whether the Capgras patient believes or thinks that his wife is an impostor, but we did not compare these ascriptions to judgments about other mental states debated in the philosophical literature on delusional contents, such as imagination.[10]

This experiment was designed to address these objections. On the one hand, we investigate whether people think Capgras patients should believe the content of their delusions. On the other hand, we contrast belief ascription with another rival attitude advocated in the delusional literature: imagination.

Method

Participants (N = 137)[11] read the Frequent story from Experiment 2 (i.e. the prototypical Capgras case). They were randomly assigned to one of two

[10]We thank Maura Tumulty for helpful discussion on this point.
[11]Fifty-eight female, aged 18–62 years, M = 31.6, SD = 10.54; 93% reported English as a native language.

conditions, Thinks Contrast or Believes Contrast, distinguished by the contrasts featured in the probe with imagination. In the Thinks condition, participants were asked which better describes the case:

> *Thinks Contrast*. Don _____ that Katherine is an impostor. [at least on some level thinks/is just imagining]

In the Believes condition, participants were given the same open sentence, but had different options:

> *Believes Contrast*. Don _____ that Katherine is an impostor. [actually believes/just imagines]

Answers to both of these questions were collected on a dichotomous forced choice scale. The order of answer choices randomized. Finally, in both conditions, participants then advanced to a new screen and responded to an open probe:

> *Should Control*. Given his evidence, Don _____ [believe/think] that Katherine is an impostor.

Responses were collected on a 6-point scale with anchors ranging from 'Definitely shouldn't' to 'Definitely should', with no neutral midpoint. Participants could not return to previous screens to change their answers.

Results

We made two predictions. First, when 'imagines' is explicitly contrasted with 'thinks' or 'believes', participants will still continue to ascribe belief. Second, participants will answer that the patient should *not* believe or think that Katherine is an impostor.

Both predictions were true. Despite having the opportunity to describe Don's attitude in terms of imagining, participants continued to attribute beliefs to Don at rates significantly exceeding chance. In the Thinks condition, the majority of participants (90%) chose 'thinks' over 'imagines', binomial test, $p < .000001$. In the Believes condition the majority (63%) of participants chose 'believes' over 'imagines', binomial test, $p < .05$.[12] Figure 4 visualizes the results. We also found that participants overwhelmingly said that Don *should not* believe or think that his wife is an impostor ($M = 1.87$, $SD = 0.91$), $t(136) = -21.1$, $p < .000001$.

[12]We also found a statistically significant medium-sized effect of probe on answers to the test question, whereby 'thinks' more so than 'believes' was chosen over 'imagines', $\chi 2 = 13.34$, $p < .001$, Cramer's $V = .312$. Cramer's V is a non-parametric correlation coefficient that indicates the strength of correlation between nominal variables. We follow Ellis [2010] for interpreting magnitudes of effect sizes using this measure. This finding further supports the arguments presented in Buckwalter, Rose, and Turri 2013, regarding the distinction between 'thick' and 'thin' belief.

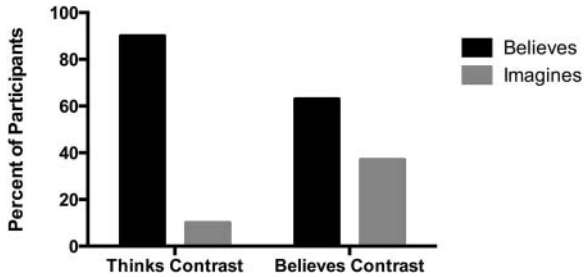

Fig 4. Experiment 4. Percentage of participants ascribing belief (at least on some level thinks/actually believes) or imagination grouped by Thinks Contrast and Believes Contrast conditions.

Discussion

These findings replicate our previous results suggesting that folk psychology recognizes cases of monothematic delusion as cases of belief. They also show that belief ascription in these cases isn't due to charity or the unavailability of other options.

6. Experiment 5: Generality and Reaction Time

In this final experiment, we address three natural concerns about our findings thus far.[13] First, although frequent assertion affects rates of belief ascription to delusional patients in these cases, perhaps frequent assertion would not influence rates of belief ascription to non-delusional subjects. Second, although people attribute belief at high rates to delusional patients, people might do so only reluctantly. If either of these things were true, it would suggest that delusions are still somewhat atypical beliefs. Third, we have only tested cases involving Capgras delusions. Perhaps other monothematic delusions are viewed differently. We will address these concerns by comparing a delusional agent to a non-delusional agent, collecting reaction-time data, and focusing on a different type of delusion (in this case, Fregoli). Collecting reaction times will allow us to determine whether people take significantly longer to decide in delusional cases. Research in cognitive psychology shows that atypicality affects performance by increasing the time people take to complete categorization tasks [Smith and Kosslyn 2007: 179; see also Rosch 1975].

Method

Participants ($N = 120$)[14] were randomly assigned to one of four conditions, in a 2 (Mentality: Passionate, Delusional) $\times$ 2 (Frequency: Once, Daily) between-subjects design.

[13]We would like to thank two anonymous referees for raising these points.
[14]Forty-seven female, aged 18–64 years, $M = 30.47$, $SD = 10.55$; 96% reported English as a native language.

> Don works in a large office building. He also has a rare [passion for mystery novels/delusional psychiatric disorder] that can cause strange behaviour. For instance, one day, Don tells his boss, 'You look just like a normal citizen, but you're really a foreign spy, working on a secret mission.' [And/But] that [was/was not] the only time Don said that. From then on, he [never said it again/said it every day].

Participants then rated their agreement or disagreement with the following statement, on the same 7-point scale used in Experiment 2: 'Don believes that his boss is a spy.' To ensure that our Mentality manipulation was effective, we included the following manipulation check, which was presented on a separate screen: 'Don has a rare _____' [passion for novels/psychiatric disorder].

Results

The manipulation was extremely effective, with over 90% of participants responding as predicted. Planned comparisons indicated that Frequency affected belief attribution for both the Delusional (Once/Daily, $M = 3.53/5.43$, $SD = 1.78/1.78$), $t(58) = 4.15$, $p = .000$ and Passionate cases (Once/Daily, $M = 3.37/4.27$, $SD = 1.56/1.80$), $t(58) = 2.07$, $p = .043$. And planned comparisons indicated that reaction times did not significantly differ between the Delusional ($M = 11.35$ seconds, $SD = 8.04$) and Passionate cases ($M = 10.74$ seconds, $SD = 6.50$), $t(118) = .451$, $p = .653$.

Discussion

The present results address all three concerns mentioned in the introduction to this experiment. We observed that frequency of assertion affects belief ascription in delusional and non-delusional cases alike. And we observed that frequency of assertion affects belief ascription for a different monothematic delusion. Finally, the reaction-time data undermine the suggestion that people attribute belief in delusional cases only reluctantly.

7. Conclusions

Do delusional patients believe the content of their delusions? The folk psychology of belief has played a large role in recent attempts to answer this question. Some theorists answer 'no'; others offer a qualified 'yes', suggesting that if delusions are characterized as beliefs then delusions are 'anomalous beliefs', or that they are beliefs in some contexts but not others [Reimer 2010], or that they aren't 'fully' beliefs because they don't 'fully meet any relevant folk-psychological stereotype' for belief [Tumulty 2012: 30 n. 2; see also Schwitzgebel 2001; 2011]. Even among theorists who otherwise disagree deeply over monothematic delusions, there is widespread

agreement that delusions don't fit the functional profile of belief [Bayne 2010: 330].[15]

For a debate largely centred on the folk psychology of belief, it is surprising that there has been no empirical investigation of the folk practice of belief ascription in cases of delusion. We sought to rectify this, suspecting that both sides were wrong to assume that delusions were anything other than uncontroversial cases of belief. To test this suspicion, we conducted a series of experiments to measure how people ordinarily view cases involving such delusions.

The results show that our suspicion hit the mark. It turns out that monothematic delusions are overwhelmingly viewed as beliefs (Experiment 1). Rates of belief ascription were at or near ceiling, strongly suggesting that, at least on the ordinary way of thinking, these delusions are not only beliefs, but stereotypical beliefs. They fit at least one stereotypical profile for belief.

But what profile might that be? It turns out that the delusional patient's verbal behaviour is a powerful cue to belief ascription (Experiment 2). In folk psychology, persistent assertion cues belief ascription. Surprisingly, for participants in our studies, a persistent pattern of assertion was a much stronger cue to belief ascription than a robust and consistent profile of non-verbal behaviour was. Apparently, in folk psychology, words speak louder than actions. Or perhaps the way to put it is this: speech acts are the loudest actions of all.[16] This finding coheres with previous work in experimental philosophy [Buckwalter, Rose, and Turri 2013] and developmental psychology [Roth and Leslie 1991; see also Nichols and Stich 2003], which suggests that assertion is a powerful cue to belief ascription.

We also investigated whether delusional patients were ordinarily viewed as having contradictory beliefs. Across two studies, participants tended to ascribe contradictory beliefs. We observed this result both between-subjects (Experiment 2) and within-subjects (Experiment 3). We provided evidence that, when given other ways to describe the delusional patient's attitudes (e.g. as imaginings), participants continue to prefer to describe them in terms of belief (Experiment 4). Finally, we showed that our basic findings aren't limited to one particular type of delusion and that they extend even to non-delusional cases; moreover, based on reaction times, it does not appear that people hesitantly or reluctantly attribute belief to delusional agents (Experiment 5).

While our results suggest that the folk view cases of monothematic delusions as stereotypical beliefs, we acknowledge that some researchers engage in viable projects that might permit them to disconnect from the folk psychology of belief and characterize delusions differently. For instance, some philosophers might be engaged in normative projects arguing that the folk are wrong to characterize stereotypical beliefs in the ways we have uncovered. And some cognitive scientists might focus on investigating the cognitive or neurological processes that underwrite instances of delusion, where

[15]For more on functionalism in folk psychology and the metaphysics of mind, see Buckwalter and Phelan [2013; forthcoming].

[16]Or, in a memorable slogan offered by the father of one of the authors, 'words may die inside your head, but even God can't erase what's been said.'

this is divorced from folk psychology entirely [Blackwood et al. 2001; Gerrans 2013]. Our focus has only been on the ordinary concept of belief in relation to instances of delusion, and so the present study is not intended to discredit or even dispute such prescriptive or revisionary projects concerning the folk psychology of belief or projects aimed at understanding the underlying cognitive processes involved in delusion.

Our results are relevant to those with prescriptive or revisionary tendencies. After all, an adequate empirical understanding of the folk psychology of belief is a precondition for determining whether to prescribe better practices, or whether a proposal counts as revisionary in the first place. Beyond this, it's important to understand folk psychology because it enables significant success in predicting and explaining the behaviour of others [Kitcher 1984; Fodor 1987; Lahav 1992]. This considerable success in turn provides a baseline standard against which revisionist theories can be measured. We tend to favour the conservative view that significant divergence from folk psychology is a noteworthy, though not necessarily prohibitive, cost of a theory. But it's not our purpose to defend that stance here, and neither our findings nor our interpretation of them depends on it.[17]

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Received: June 2013
Revised: March 2014

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[17]We would like to thank Carolyn Buckwalter, John Buckwalter, Lisa Bortolotti, Richard Dub, Dan Greco, Joshua Knobe, Shaun Nichols, Eric Schwitzgebel, Maura Tumulty, Angelo Turri, and two anonymous referees for helpful feedback on earlier drafts of this paper. This research was supported by the Social Sciences and Humanities Research Council of Canada and by an Ontario Early Researcher Award.

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