The Objects of Belief and Credence

DAVID BRAUN

University at Buffalo

dbraun2@buffalo.edu

Abstract: David Chalmers (2011) uses Bayesian theories of credence to argue against referentialism about belief. This paper argues that Chalmers's Bayesian objections to referentialism are very similar to older, more familiar objections to referentialism. There are familiar responses to the old objections, and there is a predictable way to modify those old responses to meet Chalmers's Bayesian objections. The new responses to the new objections are no less plausible than the old responses to the old objections. Chalmers's positive theory of belief and credence is structurally similar to typical referential theories of those objects, but his theory is more speculative and dubious.

David Chalmers (2011) argues against *referentialism about belief* in a recent article in this journal. (Subsequent page numbers refer to this work.) As Chalmers defines it, referentialism about belief is roughly the view that the objects of belief are completely determined by the properties and relations that they attribute to individuals. More precisely, Chalmers (pp. 587-88) says that a theory counts as a referential theory of belief if it entails the following: if N_1 and N_2 are names of the same object, and $\ulcorner A$ believes that N_1 is $F\urcorner$ is true, then $\ulcorner A$ believes that N_2 is $F\urcorner$ is true. One familiar sort of referentialism is the view that the objects of belief are Russellian

propositions. Another is the view that the objects of belief are sets of metaphysically possible worlds. Chalmers's main argument against referentialism (outlined on p. 588) appeals to Bayesian theories of credence. Chalmers says that Bayesianism is true, and places certain constraints on the objects of credence. Referential propositions do not satisfy those constraints, and so are not the objects of credence. But credences are degrees of belief, and so the objects of credence are also the objects of belief. Thus, Chalmers concludes, the objects of belief are not referential, and so referentialism about belief is false. Chalmers then goes on to present a positive theory of the objects of belief and credence.

In this paper, I argue that Chalmers's Bayesian objections to referentialism are very similar to older, more familiar objections to referentialism. There are familiar responses to the old objections, and there is a predictable way to modify those old responses to meet Chalmers's Bayesian objections. The new responses to the new objections are no less plausible than the old responses to the old objections. Thus, Chalmers's Bayesian objections to referentialist theories present virtually the same issues as the old objections. Moreover, Chalmers's positive theory of the objects of credence and belief is structurally similar to typical referential theories, but his theory has problems that referential theories do not. [1]

1. Russellianism and rational belief

I shall concentrate almost entirely on defending one particular form of referentialism from Chalmers's objections, namely a version of Russellianism. Russellianism says that the objects of belief, and the semantic contents of declarative sentences, are Russellian propositions. Russellian

[1] Chalmers 2011 is a revision of Chalmers 2006, which was presented at the Online Philosophy Conference in 2006. Braun 2006a is my comment on that paper for that conference. The present paper borrows from my 2006a, but in that paper I focused on Chalmers's claims about Russellianism and *synchronic coherence* of degrees of belief, whereas in this paper I say much more about Russellianism and *diachronic change* in degrees of belief.

propositions have constituent structures; their basic constituents are individuals, properties, and relations. On all versions of Russellianism, the semantic content of a predicate is a property or relation. On Millian versions of Russellianism, the semantic content of a proper name is an individual, namely its referent. So according to Millian Russellianism, the semantic content of 'Jekyll smokes' is a Russellian proposition that has Jekyll himself and the property of smoking as constituents (and nothing else). Millian Russellianism also says that 'that'-clauses refer to the semantic contents of their embedded sentences, and the semantic content of 'believes' is a binary relation that holds between agents and Russellian propositions. I focus on Millian versions of Russellianism in this paper; I henceforth use the term 'Russellianism' to refer to them.[2]

There are many objections to Russellianism. Many focus on intuitions about truth values, but some focus instead on the rationality of belief. Let us review those objections, and typical Russellian replies to them, so that we can see how those replies can be extended to Chalmers's probabilistic objections.

Suppose that Jekyll is identical with Hyde, and suppose that *dreadfulitis* is a dreadful congenital disease. According to Russellianism, sentences (1) and (2) semantically express the same proposition.

(1)   Jekyll has dreadfulitis.

(2)   Hyde has dreadfulitis.

Therefore, if Russellianism is true, then (3) and (4) semantically express the same proposition.

_____

[2] Chalmers also seems to use the term 'Russellianism' to refer to Millian Russellianism. Bertrand Russell himself was not a Millian. Moreover, at some points in his career he denied that agents believe the things that Chalmers and I call 'Russellian propositions'.

> (3)   Olivia believes that Jekyll has dreadfulitis.

> (4)   Olivia believes that Hyde has dreadfulitis.

If (3) and (4) express the same proposition, then they (necessarily) have the same truth value. Yet (the objection goes), Olivia may understand and vigorously assent to (1), while understanding and vigorously dissenting from (2). If she does, then (3) is true and (4) is false. So, Russellianism is false. Call this version of Frege's puzzle *the Substitution Objection*. We could reasonably say that the Substitution Objection is a semantic objection, for it relies on intuitions about the truth values of (3) and (4).

But other familiar arguments against Russellianism rely heavily on premises about rational belief. Suppose Olivia vigorously assents to (1) and the *negation* of (2), namely 'Hyde does not have dreadfulitis'. Then (5) and (6) are both true.

> (5)   Olivia believes that Jekyll has dreadfulitis.

> (6)   Olivia believes that Hyde does not have dreadfulitis.

But if Russellianism is true, then the proposition that Hyde does not have dreadfulitis is the negation of the proposition that Jekyll has dreadfulitis. So if Russellianism is true, then Olivia believes a proposition and its negation. But Olivia is rational, and no rational agent believes a proposition and its negation (call this last claim *the No Rational Belief in Contradictions Principle*.) [3] Therefore, the objection concludes, Russellianism is false. Unlike the previous

---

[3] The No Rational Belief in Contradictions Principle is too strong to be true. The following qualified version is more plausible: No rational agent who is actively, consciously contemplating a proposition and its negation believes both. Even more qualifications are probably needed. But I shall not discuss any others, because the standard Russellian response to the preceding objection does not focus on the need for qualifications of this sort.

objection, this one makes an ineliminable appeal to a principle about rational belief. Call it *the*

No Rational Belief in Contradictions Objection.

Another kind of familiar objection relies on claims about *updating* beliefs. For example,

Kripke's Pierre (Kripke 1979) assents to 'Si New York est jolie, Londres est jolie aussi' and later

assents to 'London is not pretty'. Kripke points out that Pierre may rationally fail to conclude

that New York is not pretty. We can construct a similar example using Olivia. Imagine that at

time *t*, Olivia assents to (7).

(7)   If Jekyll has the alpha gene and Jekyll has the beta gene, then Jekyll has

dreadfulitis.

At a later time t', she assents to (8), while continuing to assent to (7).

(8)   Jekyll has the alpha gene and Hyde has the beta gene.

Nevertheless, she dissents from (1), 'Jekyll has dreadfulitis', at t'. (Let us further assume that she

either dissents from, or remains agnostic about, all sentences that attribute dreadfulitis to

Jekyll/Hyde.) All of this seems consistent with Olivia's being rational. But if Russellianism is

true, and Olivia assents to both (7) and (8), then (9) and (10) are true.

(9)   Olivia believes that Jekyll has the alpha gene and Jekyll has the beta gene.

(10)   Olivia believes that if Jekyll has the alpha gene and Jekyll has the beta gene, then

Jekyll has dreadfulitis.

So if Russellianism is true, Olivia believes a conditional proposition and its antecedent. A rational person who believes a conditional proposition and its antecedent either begins to believe its consequent, or ceases to believe its antecedent, or ceases to believe the conditional (call this *the Modus Ponens Principle*).[4] But Olivia is rational, and does none of these. So, Russellianism is false. Call this argument *the Modus Ponens Objection*. Like the No Rational Belief in Contradictions Objection, it relies on a principle about rational belief.

Russellians typically respond to the objections from rational belief by rejecting the principles on which they rely. Rational people can believe both a proposition and its negation. In fact, Olivia and Pierre are plausible examples. Rational people can fail to perform modus ponens while believing a conditional proposition and its antecedent. Again, Olivia and Pierre are plausible examples. But Russellians (typically) do not rest content with merely rejecting these principles. After all, other examples indicate that those principles point at something that is correct. Suppose that Olivia's dim-witted brother Oliver assents to both 'Jekyll has dreadfulitis' and its negation (while taking 'Jekyll' to name the same person both times). Then surely he does violate some principle of rational belief. Suppose Oliver also assents to conditional (8) and to its antecedent, but nonetheless fails to assent to its consequent, 'Jekyll has dreadfulitis'. Then Oliver is in some way irrational.

To explain why Olivia is rational and Oliver is not, many Russellians maintain that belief is a *mediated* binary relation, in which the mediators are *propositional guises* (or *ways of taking*

---

[4] The Modus Ponens Principle, like the No Rational Belief in Contradictions Principle, is too strong, for a rational person who believes a conditional proposition and its antecedent may fail to believe its consequent and fail to reject the conditional or antecedent, simply because he has not considered all of the propositions at the same time. But I will ignore these sorts of qualifications to the principle, as they are irrelevant to typical Russellian responses to the Modus Ponens Objection.

propositions or *modes of presentation of propositions*).[5] An agent believes a proposition by standing in a certain psychological relation to a guise that determines that proposition for that agent. Consequently, any time an agent stands in the binary belief relation to a proposition, she also stands in a certain *ternary* relation to both a guise and that proposition. Let 'Guise(*x*, *P*, *A*)' abbreviate '*x* is a guise of (proposition) *P* for (agent) *A*', and let '*BEL*' express the previously mentioned ternary relation. Then we can describe the relation between believing and *BEL* as follows (see Salmon 1986, 1995).

A believes *P* iff $\exists x$(Guise(*x*, *P*, *A*) & *BEL*(*A*, *P*, *x*)).

I will use sentences of the form ⌜*A BELs P* under *x*⌝ as English versions of ⌜*BEL(A, P, x)*⌝. I will also sometimes say that an agent *believes* a proposition *P under* a certain guise, thus using adverbial modification of the binary belief predicate to mimic the use of the ternary *BEL* predicate.

An agent can *BEL* a proposition under more than one guise. For example, if Sherlock assents to both 'Jekyll is Jekyll' and 'Jekyll is Hyde', then he *BEL*s the proposition that Jekyll/Hyde is Jekyll/Hyde under at least two guises. Furthermore, an agent can believe a proposition under one guise, and fail to believe it under another guise. He can also believe a proposition under one guise and believe the negation of that proposition under another guise.

Guises stand in logical relations to one another (Salmon 1995). Suppose Pierre utters 'London has over fifty million residents' and then immediately learns that this is not the case, and so utters 'London does not have over fifty million residents'. He thereby asserts the

---

[5] See Salmon 1986, 1989, 1995; Soames 1987, 1990; Braun 1998, 2000, 2001a, 2001b, 2006b. See also the work of the relaxed Russellians, cited in the main text below.

propositional-negation of the proposition that he formerly asserted, using a sentence that is the sentential-negation of the sentence that he formerly uttered. He also believes the propositional-negation of the proposition that he formerly believed, under a guise that is the guise-negation of the former guise. For every guise, there is exactly one guise that is its guise-negation. More precisely:

> If Guise(x, P, A), then there is exactly one guise y such that (i) y is the guise-negation of x, and (ii) Guise(y, not-P, A).

Let us use '*Neg(x)*' for the guise-negation of guise x. Similarly, for any pair of guises x and y (in that order), there is a guise-material-conditionalization of them, *Cond*(x, y), a guise-conjunction of them, *Conj*(x, y), and a guise-disjunction of them, *Disj*(x, y).

Using guises and the ternary *BEL* relation, we can explain why Olivia is rational and Oliver is not. Olivia *BEL*s the proposition that Jekyll/Hyde has dreadfulitis under a certain guise *jd*, one that she associates with 'Jekyll has dreadfulitis'. She *BEL*s the proposition that Jekyll/Hyde does not have dreadfulitis under a certain guise ¬*hd*, one that she associates with 'Hyde does not have dreadfulitis'. But ¬*hd* is not the guise-negation of *jd*, so this is consistent with Olivia's being rational. Her dim-witted brother Oliver, however, *BEL*s that Jekyll has dreadfulitis under a certain guise *jd*, and also *BEL*s that Jekyll does not have dreadfulitis under the guise ¬*jd*, which is the guise-negation of *jd*, *Neg(jd)*. [6] So, Oliver is irrational. His brilliant sister Olivia *BEL*s the proposition that (Jekyll/Hyde has the alpha gene and Jekyll/Hyde has the beta gene) under a certain guise *jahb*, which is the guise that she grasps when she considers

---

[6] For ease of exposition, I pretend here, and in the rest of this paragraph, that Olivia and Oliver share some guises, and these are guises of the same propositions for both of them.

sentence (8) ('<u>J</u>ekyll has the <u>a</u>lpha gene and <u>H</u>yde has the <u>b</u>eta gene'). She later *BEL*s the

conditional proposition that (if Jekyll/Hyde has the alpha gene and Jekyll/Hyde has the beta

gene, then Jekyll/Hyde has dreadfulitis), under the conditional guise *Cond*(*jajb*, *jd*). This is the

guise that she grasps when she considers sentence (7) ('If <u>J</u>ekyll has the <u>a</u>lpha gene and <u>J</u>ekyll

has the <u>b</u>eta gene, then <u>J</u>ekyll has <u>d</u>readfulitis'). However, she rationally does not come to *BEL*

that Jekyll/Hyde has dreadfulitis under any guise, because guise *jahb* is not the antecedent of the

conditional guise *Cond*(*jajb*, *jd*). Her dull brother Oliver, however, *BEL*s the proposition that (if

Jekyll/Hyde has the alpha gene and Jekyll/Hyde has the beta gene, then Jekyll/Hyde has

dreadfulitis), under *Cond*(*jajb*, *jd*), and he *BEL*s the proposition that (Jekyll/Hyde has the alpha

gene and Jekyll/Hyde has the beta gene) under guise *jajb*, and *jajb* is the antecedent of

Cond(*jajb*, *jd*). So, he is irrational. More generally, Russellians can endorse the following

principles, which are guise-analogs of the earlier principles concerning rational belief. [7]

> *No Contradictory Guises Principle*
>
> No rational agent *A* is such that *BEL*(*A*, *P*, *x*) and *BEL*(*A*, not-*P*, *Neg*(*x*)).

> *Guise Modus Ponens Principle*
>
> If *A* is a rational agent, and *BEL*(*A*, if *P* then *Q*, *Cond*(*x*, *y*)) and it comes to be the case
>
> that *BEL*(*A*, *P*, *x*), then it will come to be the case that either (a) *BEL*(*A*, *Q*, *y*) or (b) it is
>
> not the case that *BEL*(*A*, *P*, *x*) or (c) it is not the case that *BEL*(*A*, if *P* then *Q*, *Cond*(*x*, *y*)).

---

[7] These guise principles are too strong, in exactly the ways in which the No Rational Belief in Contradictions
Principle and the Modus Ponens Principle were too strong. But for every qualification that a non-Russellian wishes
to add to her principles, a Russellian can add an analogous guise-theoretic qualification to his principles.

Generally speaking, rationality of belief is determined by rationality of *BEL*ing. A person rationally believes a proposition iff there is a guise under which she rationally *BEL*s that proposition.

Rational Believing and BELing

Agent *A* rationally believes proposition *P* iff $\exists x$(Guise(*x*, *P*, *A*) & Rationally *BEL*(*A*, *P*, *x*)).

Let us use 'Guise Russellianism' to refer to the view that combines Russellianism with these claims about rationality and guises.

According to Guise Russellianism, belief is a binary relation, and the objects of belief (the things that agents believe) are propositions, yet one must mention guises to explain agents' rational belief in propositions. This may be surprising, but perhaps the following analogy will make it less so. Assertion is a binary relation between agents and propositions. But I can *loudly* assert that Obama is the President (by speaking) while also simultaneously *silently* asserting that Obama is the President (by e-mail). I can do this because assertion is a binary relation that is *mediated* by utterances, and an agent's *sonic* relations to propositions are determined by the sonic properties of those mediators. Analogous points hold for belief: it is a binary relation between agents and propositions, but whether an agent *rationally* believes a proposition depends on the properties of the mediators of belief.

You might wonder what these guises are. All Russellians would say that they are the things that play the above-described roles. Some would say no more than this. Russellians who say more differ among themselves about the nature of guises. A few might say that they are

10

natural language sentences or the linguistic meanings (Kaplanian characters) of such sentences. But most would deny this because of Paderewski cases and John-Perry-type cases (Perry 1977, 1979). Some Russellians would hold that guises are (intrinsic) mental states. Quite a few would hold that guises are mental representations, such as formulas in a language of thought, which are involved in intrinsic mental states of the previous sort (Crimmins and Perry 1989, Richard 1990, Crimmins 1992, Braun 1998).

Russellians also typically appeal to guises to respond to the earlier semantic objections. A rational person may assent to (1) and fail to assent to (2) because she *BEL*s that Jekyll has dreadfulitis under a guise she associates with 'Jekyll has dreadfulitis', but she fails to *BEL* that Jekyll has dreadfulitis under the guise she associates with 'Hyde has dreadfulitis'. To explain why speakers incorrectly think that (3) and (4) can differ in truth-value, some Russellians appeal to pragmatics. They say that, though (3) and (4) semantically express the same proposition, utterances of (3) and (4) pragmatically convey different propositions concerning *BEL* and different guises, and these pragmatically conveyed propositions concerning guises really do differ in truth value. I differ from these Russellians in that I doubt that speakers' judgments about (3) and (4) can always be explained by pragmatics (Braun 1998, 2006b). I think that speakers are rationally able to think that (3) can be true while (4) is false because they entertain the proposition that (3) and (4) express under two different guises, and so appeal to pragmatics is unnecessary. I also believe that a fuller pragmatic explanation of intuitions about (3) and (4) ultimately requires one to suppose that speakers grasp the proposition they express under two guises. But I am now describing a family dispute among Russellians. Either sort of Russellian can explain why ordinary people can use belief attributions to explain and predict behavior, even

though ordinary people's judgments about the truth values of those attributions are often

mistaken. (For details, see Braun 2000, 2001a, 2001b. See Braun 2006b for a short summary.)

So far, I have been discussing the views of *strict* Russellians, such as Salmon, Soames,

and myself. *Relaxed* Russellians agree with strict Russellians on the existence of *BEL* and guises,

and on the role of guises in determining rational belief, but disagree with strict Russellians on the

semantics of belief ascriptions. In particular, relaxed Russellians disagree with strict Russellians

about the semantics of either 'believe' or 'that'-clauses. Schiffer (1978, 1987), Crimmins and

Perry (1989), and Crimmins (1992) think that (roughly speaking) the semantic content of

'believe', in all contexts, is the ternary *BEL* relation. The proposition semantically expressed by

a belief attribution, in a context, includes a guise as a constituent, though the attribution contains

no expression that refers to it. Thus these relaxed Russellian theories are sometimes called

hidden indexical theories. Mark Richard (1990) instead holds that 'believe' expresses different

binary relations in different contexts, depending (roughly) on the thoughts that the attributer has

about the believer's guises; Richard also holds that 'that'-clauses refer to amalgams of words and

Russellian propositions. On both sorts of view, (3) and (4) really do differ in truth-value, in some

contexts. Nevertheless, strict Russellians and relaxed Russellians agree that the rationality of

belief depends heavily on guises.

I have now described typical Russellian responses to familiar objections from rational

belief, rational belief change, speakers' judgments about truth-values, and speakers' use of belief

attributions to explain behavior. There are, no doubt, substantive remaining issues concerning

Russellian claims about guises and rational flat-out belief. Unfortunately, I cannot discuss these

issues here. But I can now describe how Chalmers's Bayesian objections to referentialism and

Russellianism parallel the preceding objections, and how Russellians can respond to Chalmers's objections in a parallel way.

2. Bayesianism, Russellianism, and rational partial belief

Bayesians seek more refined constraints on rationality than we have seen so far. They say that agents believe propositions to varying degrees between 0 and 1 (inclusive). They call this 'partial belief', and describe it using attributions such as 'John is highly confident that snow is white', 'Mary has a credence of .5 in the proposition that the coin came up heads', and 'Kim believes to degree .9 that Obama was the US President in February 2009'. Bayesians wish to state rational constraints on degree of belief, and revision in degree of belief.

The relation between *flat-out* belief and partial belief is complicated. For instance, according to Bayesians, an agent can partially believe a proposition without flat-out believing it. Here is an obvious case: I do not believe that the lottery ticket that I just purchased will win. But Bayesians say that I do partially believe that proposition to some degree less than .5, for instance, to degree .0001. To avoid confusion between flat-out belief and partial belief, I will introduce a new ternary attitude verb, *d-believe*, to discuss the latter. (The letter 'd' is meant to suggest 'degree'.) I will settle on the following form of English ascription: $\ulcorner$*A* d-believes *P* to degree *n*$\urcorner$. Thus, I will use 'd-believe' in roughly the same way that others use 'partially believe'. For example, rather than say that Mary *partially believes* that the coin came up heads to degree .5, I will say that Mary *d-believes* that the coin came up heads to degree .5.

In principle, a theorist of d-belief could hold that agents sometimes rationally d-believe a single proposition to more than one degree. However, Bayesians typically assume that this is not the case, at least ideally. Given this assumption (or idealization), Bayesians can reasonably

13

assume that for every agent A, there is a function p_A from propositions P to numbers n between 0

and 1 (inclusive) such that p_A $(P){=}n$ iff A d-believes P to degree n. Often this function is called

'A's credence function'. According to typical Bayesians, rational agents' credence functions

(ideally) satisfy the axioms of probability theory. That is, every rational agent's credence

function maps every proposition to some number n such that $n{\geq}0$; every such function maps

every logically true proposition to 1; and if such a function maps P to m and Q to n, and P and Q

are logically inconsistent, then it maps the proposition that $P{\vee}Q$ to $m{+}n$. From this it follows that

if a credence function maps proposition P to n, then it maps the proposition not-P to $1{-}n$. All of

this can be translated back to statements about d-believing: For instance, for all propositions P, if

A d-believes P to degree n, then A d-believes not-P to degree $1{-}n$.

Bayesians typically use an agent's betting behavior (or dispositions to betting behavior)

as evidence for that agent's degrees of belief. For instance, suppose A is willing to risk a lot of

money in a bet on proposition P, though A knows that she would win very little money if P were

true. Then A's degree of belief in P is high. Agent A's degree of belief can be quantified using

this betting behavior, given certain assumptions about the value that A attaches to money.

Bayesians also endorse principles about rational *updating* of degrees of belief. Suppose

that at time t, A d-believes Q to a degree greater than 0 but less than 1, and suppose that at time t'

she changes her degree of belief in proposition Q to 1 as a result of learning, and suppose she

learns nothing else. Then A must, at t', change the degrees to which she d-believes many other

propositions, if she is to remain rational. To describe the needed change, many Bayesians first

define A's *conditional probability function* $p_A(P|Q)$ as follows: $p_A(P|Q){=}\ p_A(P\&Q)/\ p_A(Q)$, if

$p_A(Q)>0.$ [8] (Bayesians often use attributions of the form ⌐A believes P, conditional on Q, to

degree n⌐, when they want to indicate that $p_A(P|Q) = n$.) If p_A is A's *prior* credence function

(before changing her degree of belief in Q at t'), and P is any proposition, and A comes to believe

Q to degree 1 as a result of learning (and A learns nothing else), then according to Bayesians, her

posterior credence function, p'_A, should be such that $p'_A(P) = p_A(P|Q)$, if $p_A(Q)>0$. Bayesians call

this change *conditionalizing* on one's prior credence function, and they hold that rational agents

update their credence functions by conditionalization. All of this can be restated using only the

predicate 'd-believe'. Suppose, as above, that A is rational, and that at t (i) A d-believes Q to

degree j, where $0<j<1$ and also (ii) A d-believes $P\&Q$ to degree i. Suppose that at t', A comes to

d-believe Q to degree 1 as a result of learning, and A learns nothing else. Then at t' A comes to d-

believe P to degree i/j. We could also introduce a four-place predicate, *conditionally-d-believe*,

and a standard attribution of the form ⌐A conditionally-d-believes P, on Q, to degree n⌐, and

define this relation in terms of unconditional ternary d-belief in a straightforward way. [9] We

could then restate the update rule as follows: Suppose that at t (i) A d-believes Q to a degree

greater than 0 but less than 1, and (ii) A conditionally-d-believes P, on Q, to degree n. Suppose

that at t', A comes to d-believe Q to degree 1 as a result of learning, and A learns nothing else.

Then at t', A begins to d-believe P to degree n.

We are now ready for Chalmers's Bayesian objections to referentialism. Chalmers argues

that if Bayesianism is true, then the objects on which an agent's credence function is defined are

---

[8] Propositions P and Q may be logically complex. Some Bayesians (e.g., Hájek 2003) argue that Bayesians should
take conditional probability as primitive, and use it to analyze unconditional probability. Chalmers seems to prefer
taking unconditional probability as primitive, but see p. 631. I do not need to take a stand on the matter: see note 9.
(Thanks to David Christensen for discussion.)
[9] Here is the definition: A conditionally-d-believes P, on Q, to degree n iff: (i) A d-believes $P\&Q$ to degree i, (ii) A
d-believes Q to degree j, where $j>0$, and (iii) $i/j=n$. As I mentioned in note 8, some Bayesians take conditional
probability as primitive. The analogous view here would take conditional-d-belief as primitive, and define a
conditional credence function in terms of it, then analyze unconditional d-belief and an unconditional credence
function in terms of one or both. I ignore this in what follows.

not referential propositions. I agree. But Chalmers argues that this casts doubt on referential theories of belief, and so on Russellianism. I disagree. I hold that Russellianism is perfectly compatible with Bayesianism, as long as Bayesianism makes use of guises. To highlight the issues, I will recast Chalmers's Stage 1 argument into an argument against Russellianism. [10] This argument resembles the earlier Modus Ponens Objection to Russellianism, and the Russellian response to this argument will be similar: bring in guises.

We join Olivia at noon on Monday. She has already examined Jekyll for the alpha gene, and discovered that he has it, and revised her credence function accordingly, to obtain p_{olivia}. She knows that she will examine Hyde that afternoon. To figure out her credence function before she sees Hyde that afternoon, we present her with the sentences 'Jekyll has dreadfulitis', 'Jekyll has the beta gene', 'Jekyll has dreadfulitis and Jekyll has the beta gene', and 'Hyde has the beta gene'. Her betting behavior suggests the following.

p_{olivia}(that Jekyll has dreadfulitis) = .1

p_{olivia}(that Jekyll has dreadfulitis | that Jekyll has the beta gene) = .9

p_{olivia}(that Hyde has the beta gene) = .01

In the afternoon, Olivia examines Hyde, and she now vigorously assents to 'Hyde has the beta gene'. She has revised her credence function again to obtain p'_{olivia}. We again present her with the previous sentences, and her betting behavior indicates the following.

p'_{olivia}(that Hyde has the beta gene) = 1

---

p'_{olivia}(that Jekyll has dreadfulitis) = .1

So after examining Hyde in the afternoon, and concluding that Hyde has the beta gene, Olivia has (seemingly) retained the same degree of belief in the proposition that Jekyll has dreadfulitis. Olivia seems rational. But (the objection says) if Russellianism is true, then her changes, and lack of changes, in her degrees of belief and her credence function, are not rational. For if Russellianism is true, then the proposition that Hyde has the beta gene is identical with the proposition that Jekyll has the beta gene. Since her new credence function p'_{olivia} assigns 1 to the proposition that Hyde has the beta gene, it also assigns 1 to the proposition that Jekyll has the beta gene. But rational agents change their degrees of belief by conditionalizing. If she had conditionalized, then her new degree of belief that Jekyll has dreadfulitis would be .9. But it is not. Therefore, Russellianism is false.

The Chalmers-style objection is much like the earlier Modus Ponens Objection. Russellians respond to that objection by denying the Modus Ponens Principle, while upholding a revised principle that takes into account that rational agents can believe a proposition under one guise, and fail to believe it under another guise. Russellians should give an analogous reply to Chalmers's Stage 1 objection. They should deny the above Bayesian conditionalization principle, while upholding a revised principle that takes into account that agents can d-believe a proposition to one degree under one guise, and d-believe it to a different degree under another guise.

In fact, from a Russellian perspective, the problems with the Chalmers-style objection occur much earlier, and go much deeper. The first few premises of the Chalmers-style argument assume that Olivia has a credence function defined on propositions. That is, the argument

assumes there is function on certain propositions (that Jekyll has dreadfulitis, etc.) that yields *the*

degree to which Olivia d-believes the proposition. But according to Russellians, there is no such

function, for Olivia d-believes many of the relevant propositions to more than one degree. For

instance, when Olivia considers, in the afternoon, the proposition that Jekyll has the beta gene

under one guise (corresponding to 'Jekyll has the beta gene'), she d-believes it to degree .01, and

when she considers that same proposition under another guise (corresponding to 'Hyde has the

beta gene'), she d-believes it to degree 1. So, she has no such credence function. Furthermore,

the argument's Bayesian conditionalization principle is true only if there is such a function for

each agent. So, the objection's conditionalization principle is not true.

But if we are attracted to Bayesianism, then we can accept a version of it that takes guises

into account. We first say that d-believing (like flat-out believing) is a relation mediated by

guises. Underlying the ternary d-believing relation is a four-place relation, *d-BEL*, which holds

among an agent, a proposition, a number, and a guise. d-believing and *d-BEL*ing are related in

just the way that flat-out believing and *BEL*-ing are, by existential generalization over guises.

A d-believes *P* to degree *n* iff: $\exists x(\text{Guise}(x, P, A)\ \&\ d\text{-}BEL(A, P, n, x))$

(I will often rephrase the last conjunction as ⌜*A d-BEL*s *P* to degree *n* under guise *x*⌝.) Idealizing,

we can state certain principles about rational *d-BEL*ing such as the following.

The d-BEL and Guise-Negation Principle

If *A* is a rational agent, and Guise(*x*, *P*, *A*) and *d-BEL*(*A*, *P*, *n*, *x*), then *d-BEL*(*A*, not-*P*, 1–

n, *Neg*(*x*)).

This is an analog to our earlier principle regarding *BEL*ing propositions and their negations under guises. More generally, we can say that rational d-belief is determined by rational *d-BEL*ing, in the following way: *A* rationally d-believes *P* to degree *n* iff: $\exists x$(Guise(*x*, *P*, *A*) & Rationally *d-BEL*(*A*, *P*, *n*, *x*)).

If we think that Bayesianism is getting at something right when it says that rational agents conditionalize, then we can state a principle for revising the degrees to which an agent *d-BEL*s a proposition under a guise that amounts to conditionalization-under-guises.

d-BELing and Updating

Suppose that *A* is rational, and suppose that at time *t*, (i) *A d-BEL*s *Q* to degree *j* under guise *y*, where 0<*j*<1, and (ii) *A d-BEL*s *P&Q* to degree *i* under guise *Conj*(*x*, *y*). Suppose that at *t'*, *A* comes to d-believe *Q* to degree 1 under guise *y* as a result of learning, and suppose *A* learns nothing else. Then at *t'*, *A* begins to *d-BEL P* to degree *i/j* under guise *x*.

We could also define a six-place relation $\ulcorner$*A* conditionally-*d-BEL*s *P* under *x*, on *Q* under *y*, to degree *n*$\urcorner$, in terms of unconditional *d-BEL*ing.[11] We could then restate the above update rule as follows. Suppose that *A* is rational, and at time *t* (i) *A d-BEL*s *Q*, under guise *y*, to some degree greater than 0 and less than 1, and also (ii) *A* conditionally-*d-BEL*s *P* under *x*, on *Q* under *y*, to degree *n*. Suppose that at *t'*, *A* comes to *d-BEL Q* to degree 1 under guise *y* as a result of learning, and suppose *A* learns nothing else. Then at *t'*, *A* begins to *d-BEL P* to degree *n* under guise *x*.

---

[11] *A* conditionally-*d-BEL*s *P* under *x*, on *Q* under *y*, to degree *n* iff: (i) *A d-BEL*s *P&Q* under *Conj*(*x*, *y*) to degree *i*, (ii) *A d-BEL*s *Q* under *y* to degree *j*, where *j*>0, and (iii) *i/j=n*. Note that *P* and *Q* may be logically complex.

So far, I have not explicitly assumed that there is at most one degree *n* to which *A d-BEL*s

a proposition *P* under a guise *x*. But if we do assume this (which seems a reasonable

idealization), then for each agent we can define a *binary* function p_A on proposition-guise pairs

such that: if Guise(*x*, *P*, *A*), then $p_A(P, x)=n$ iff *d-BEL*(*A*, *P*, *n*, *x*). We can make the idealizing

assumption that every rational agent's credence function, defined on propositions-guise pairs,

conforms to the axioms of probability.[12] We can then define a four-place conditional-probability

function for each agent, defined in terms of that agent's unconditional credence function, as

follows: $p_A(P, x \mid Q, y) = p_A(P\&Q, Conj(x, y)) / p_A(Q, y))$, if $p_A(Q, y)>0$. We can then say that

---

[12] Some technical details follow. Let us start with an axiomatization for probability functions (taken from Hájek 2012) in which the domain of a probability function is a set **S** of sentences that are closed under countable truth-functional combinations.

    i.   For all $s \in$ **S**, $p(s) \geq 0$.
    ii.   For all $s \in$ **S**, if *s* is a logical truth (in classical logic), then $p(s) = 1$.
    iii.   For all $s_1 \in$ **S** and $s_2 \in$ **S**, if s_1 and s_2 are logically incompatible, then $p(s_1 \lor s_2) = p(s_1) + p(s_2)$.

With some appropriate definitions, Guise Russellians can say that an agent's credence function, and her set of proposition-guise pairs, satisfy the axioms of probability iff they satisfy the constraints on *p* and **S** given by the above axioms. They can do so because, as I mentioned above, guises are logically related to each other in much the way that sentences in truth-functional logic are. For instance, for any guise, there is exactly one guise-negation, and for any two guises (in a certain order), there is exactly one guise-disjunction. So, proposition-guise pairs can be treated model-theoretically like sentences of a classical language, and classical definitions of 'true in a model', 'logically true', and 'logically incompatible' can be given for them. Suppose that $\mathbf{G_A}$ is the set of agent *A*'s guises (that is, the set of guises *x* such that for some proposition *P*, Guise(*x*, *P*, *A*)), and suppose that $\mathbf{G_A}$ is closed under guise-negation and guise-disjunction. (Negation and disjunction make up a truth-functionally complete set of connectives, so we can ignore all other operations on guises.) Let $\mathbf{PG_A}$ be the set of all proposition-guise pairs <*P*, *x*> such that $x \in \mathbf{G_A}$ and Guise(*x*, *P*, *A*). A *model* **M** for $\mathbf{PG_A}$ is a function from $\mathbf{PG_A}$ to truth-values that satisfies the following conditions: **M** assigns truth to <not-*P*, *Neg*(*x*)> iff **M** assigns falsehood to <*P*, *x*>, and **M** assigns truth to <*P* ∨ *Q*, *Disj*(*x*, *y*)> iff either **M** assigns truth to <*P*, *x*> or **M** assigns truth to <*Q*, *y*>. If <*P*, *x*>∈ $\mathbf{PG_A}$, then <*P*, *x*> is *logically true* iff for all models **M** of $\mathbf{PG_A}$, **M** assigns truth to <*P*, *x*>. <*P*, *x*> and <*Q*, *y*> are *logically incompatible* iff there is no model **M** that assigns truth to both. We can now say: If $\mathbf{PG_A}$ is *A*'s set of proposition-guise pairs, and p_A is *A*'s credence function, then p_A satisfies the axioms of probability iff $\mathbf{PG_A}$ and p_A satisfy the axioms given above, when they are assigned to '**S**' and '*p*', respectively. This is equivalent to saying that (i′)-(iii′) are true.

    i′.   For all <*P*, *x*> ∈ $\mathbf{PG_A}$, $p_A(P, x) \geq 0$.
    ii′.   For all <*P*, *x*> ∈ $\mathbf{PG_A}$, if <*P*, *x*> is logically true, then $p_A(P, x) = 1$.
    iii′.   For all <*P*, *x*> ∈ $\mathbf{PG_A}$ and <*Q*, *y*> ∈ $\mathbf{PG_A}$, if <*P*, *x*> and <*Q*, *y*> are logically incompatible, then $p_A(P \lor Q, Disj(x, y)) = p_A(P, x) + p_A(Q, y)$.

rational agents change their degrees of belief, under guises, by conditionalization. [13] Let us call

this view *Guise-Russellian Bayesianism*.

We can now see why Olivia's revisions in d-belief are consistent with her being rational.

Pretend, for simplicity, that Olivia's guises are English sentences. Her earlier credence function

p_A has the following features.

p_{olivia}(that Jekyll has dreadfulitis, 'Jekyll has dreadfulitis') = .1

p_{olivia}(that Jekyll has dreadfulitis, 'Jekyll has dreadfulitis' | that Jekyll has the beta gene,

'Jekyll has the beta gene') = .9.

She then examines Hyde and revises her credence function as follows.

p'_{olivia}(that Jekyll has the beta gene, 'Hyde has the beta gene') = 1

However, her degree of belief in the proposition that Jekyll has the beta gene is still low, when

she considers it under the guise 'Jekyll has the beta gene'.

p'_{olivia}(that Jekyll has the beta gene, 'Jekyll has the beta gene') = .1

So, the revised Bayesian conditionalization principle does not require her to conditionalize, or to

come to d-believe that Jekyll has dreadfulitis to .9. So, her behavior is consistent with her being

rational.

---

[13] Nothing substantial changes if we take conditional-d-belief and conditional-d-*BEL*ing (rather than d-belief and d-*BEL*-ing) as primitive.

Summarizing: Russellians use guises, and relations involving them, to state plausible principles of rational flat-out belief and rational flat-out belief revision. They can also use guises, and underlying relations involving them, to state plausible principles of rational d-belief and rational d-belief revision. These Russellian moves are just as plausible in the case of d-belief as they are in the case of flat-out belief. So, Bayesianism, degrees of belief, and rational d-belief do not raise substantially new issues for Guise Russellianism.

3. The objects of belief and the objects of credence

As I mentioned above, Chalmers early in his paper (pp. 588-89) gives an outline of an argument against referentialism about belief. If we recast it into an argument against the Russellian version of referentialism, we get something like the following.

(11a) The objects of credence are the objects of belief.

(11b) It is not the case that the objects of credence are Russellian propositions.

(11c) So, it is not the case that the objects of belief are Russellian propositions.

(11d) If Russellianism is true, then the objects of belief are Russellian propositions.

(11e) So, Russellianism is not true.

Let us assume that this argument is valid, and ask how a Guise Russellian should respond to it. [14]

The argument uses the phrase 'objects of credence'. The correct Russellian response to the argument will depend heavily on how this phrase is understood. One reasonable way to understand it is by analogy with the phrase 'objects of belief': Just as the objects of belief are the

---

[14] One might wonder about the validity of the argument because one has questions about the semantics of the plural definite descriptions that appear in it, but I propose to ignore such questions here.

things towards which agents bear the belief relation, so the objects of credence are the things towards which agents bear relations of partial belief, degrees of belief, degrees of confidence, and credence relations. But Russellians, like everyone else, should hold that the things to which agents bear credence relations are propositions. Suppose, for example, that Olivia partially believes, to degree .1, that Jekyll has the beta gene. Then she stands in the relation of partial belief, to degree .1, to the proposition that Jekyll has the beta gene. Generalizing, we can conclude that propositions are the things to which agents bear credence relations. Furthermore, agents can flat-out believe and assert the things to which they bear degrees of belief; but if that's so, then the things to which agents bear degrees of belief relations are propositions. For example, suppose that Olivia not only partially believes to degree .95 that Jekyll is English, but also flat-out believes that Jekyll is English. Suppose she (consequently) asserts that Jekyll is English. Then there is something that she (simultaneously) partially believes to degree .95, and flat-out believes, and asserts. But the thing that she flat-out believes and asserts is a proposition. Therefore, the thing that she partially believes to degree .95 is a proposition. But Russellians hold that propositions are Russellian (obviously). Thus, Russellians should hold that agents bear credence relations to Russellian propositions. So, they should deny line (11b), when 'objects of credence' is understood to refer to the things to which agents bear credence relations.

Chalmers, however, usually understands the phrase 'objects of credence' differently. He takes the objects of credence to be the things in the domains of credence functions. [15] Russellians

---

[15] Chalmers (p. 590) says 'I take it as a stipulation about 'object of credence' that objects of credence are those objects in which individuals have credence; that is, they are the objects that an individual's credence function at a time maps to credences, for the purpose of a successful theory of credence.' The first sentence (before the semi-colon) suggests (to me) the view that the objects of credence are those things to which agents bear credence *relations*, such as partial belief. The second sentence, however, clearly takes objects of credence to be the things in the domain of a credence function. Using the term 'object of credence' in this latter way may seem odd, for we do not ordinarily say that the things in the domain of a function are its objects: we do not, for instance, say that the objects of the squaring function are numbers. But using the phrase in this way would *not* be odd for someone who assumes that the things to which agents stand in credence relations are the same as the things in the domains of their

hold that the things in the domains of agents' credence functions are proposition-guise pairs. But proposition-guise pairs are not the things that agents believe, and so are not the objects of belief, according to Russellians. So, when the phrase 'object of credence' is understood in Chalmers's way, Russellians should deny line (11a).

Chalmers claims that Russellians' denial of (11a), when 'objects of credence' is understood in his way, 'puts some pressure' on referentialism about belief, including Russellianism (p. 611). Perhaps it does put some pressure on Russellianism, but if so, that pressure is no different from the pressure put on Russellians by their typical claims about guises and rational flat-out belief. As I said above, Guise Russellians hold that an agent's rationally flat-out believing a proposition depends heavily on the guises under which she believes it. So, Guise Russellians should also hold that the rationality of an agent's *partially* believing (d-believing) a proposition also depends heavily on the guises under which she partially believes (d-believes) it. But credence functions should be defined in such a way that they are useful for stating constraints on rational partial belief. Consequently, Guise Russellians should hold that the things in the domain of an agent's credence function are proposition-guise pairs. Moreover, if the Russellian use of guises succeeds in the case of flat-out belief, then it succeeds in the case of partial belief and credence functions; and if it fails in the case of flat-out belief, then it also fails in the case of partial belief and credence functions. So, the Russellian denial of line (11a), when 'object of credence' is understood as Chalmers prefers, does not raise substantially new issues for Russellianism.

---

credence functions. Chalmers usually assumes that they are the same. Guise Russellians, however, claim that they are different. Chalmers's correctly takes his Olivia example to support the conclusion that the things in the domains of rational credence functions are not Russellian propositions. So, his example supports (11b), when 'object of credence' is construed in Chalmers's way. But Olivia provides no support for the conclusion that it is not the case that the things to which agents stand in credence relations are Russellian propositions, unless one assumes (contrary to the Russellians) that these objects are the same as the objects in the domains of rational agents' credence functions.

4. Chalmers's criticisms of Guise Russellianism

Chalmers (pp. 600-01, 609-11) discusses the preceding use of guises by referentialists. [16] He concedes that referentialists can use guises to state plausible principles of rational degree of belief and belief change, and that they can take the objects in the domains of credence functions to be propositions-guise pairs (p. 601, first full paragraph). But he criticizes this sort of guise-referentialism in the following passage.

> The resulting referentialist position is somewhat uncomfortable, as one can apply the arguments given earlier to credence ascriptions such as 'Olivia has low confidence that Jekyll is Hyde is low' [*sic*—DB] and so on. Perhaps the referentialist will give some special treatment of such sentences, as they do for belief sentences. For example, they might argue that such a sentence expresses the false proposition that $p(JH)$ is low, while conveying the true proposition that $p(JH^*)$ is low. Alternatively, they might hold that it makes tacit reference to a contextually specified guise, saying correctly that $p(G_1, JH)$ is low. [Footnote 8, omitted here—DB] Presumably they will say the same for many or most other subjective probability claims involving names. The first option requires denying the truth of claims that play a highly successful and systematic explanatory role, while the second option requires significant complexity. These outcomes are not foreign to the referentialist, but I think they give reason to take seriously a view on which the referents of 'that'-clauses are non-referential too. (pp. 609-10)

---

[16] Chalmers (pp. 600-601) discusses two different ways in which referentialists (and so Russellians) might use guises. The first way relativizes credence functions to guises, and says that each agent has many guise-relative credence functions, as many as she has guises; and each of these functions assigns a number to every proposition, whether or not the guise to which it is relativized has anything to do with that proposition. Chalmers rightly criticizes that view. But this is *not* the view that I endorsed above. I instead endorsed a view of the second sort that Chalmers mentions (p. 601, first full paragraph), according to which each rational agent has a single credence function, whose domain contains proposition-guise pairs.

The above passage contains some incorrect and misleading claims about referentialism. [17] But more importantly, Chalmers's objections to guise-referentialism in this passage have nothing to do with rationality of partial belief. They instead have to do with the semantics of, and intuitions about the truth values of, attributions of partial belief. Chalmers claims that a (guise-) referential semantics of credence attributions such as $\ulcorner A$ has low confidence that $S\urcorner$ and $\ulcorner p_A(X)$ is low$\urcorner$ would attribute truth values that conflict too much with intuition. He also worries that such a view attributes falsehood to attitude ascriptions that play an important role in a successful theory. But these are essentially the same *semantic* objections that others have made to Russellian theories of flat-out belief attributions. Russellians can respond in parallel ways to Chalmers's parallel semantic objections.

---

[17] I have in mind Chalmers's claims about referentialists' views of (i) and (ii).

      i.   Olivia has low confidence that Jekyll is Hyde.
      ii. $p(JH)$ is low.

Chalmers suggests that referentialists would say that (i) is false. But if we extend a strict Russellian view of belief attributions to ordinary *confidence* attributions such as (i), then we get the result that (i) is *true*, for Olivia has low confidence in the proposition that Jekyll is Hyde under her 'Jekyll is Hyde' guise. This is, of course, compatible with her also having high confidence in that proposition under her 'Jekyll is Jekyll' guise, and so compatible with the truth of 'Olivia has high confidence that Jekyll is Hyde', according to strict Russellians. (Possible-worlds referentialists would also say that (i) is true.) Relaxed Russellians could hold that (i) is true in some contexts and false in others. Chalmers suggests that guise-referentialists would hold that (i) and (ii) express the same proposition. Perhaps some possible-worlds theorists would, but no guise Russellian would, for (i) and (ii) differ too much in grammatical structure. Chalmers suggests that guise-referentialists could hold that (ii) is false and '$p(JH^*)$ is low' is true, where JH^* is a surrogate for JH. However, strict Russellians might say that the functor 'p' fails to have a semantic content, if a Bayesian introduces it while falsely assuming that Olivia has a single credence function defined on propositions. If 'p' lacks content, then either (a) both '$p(JH)$' and '$p(JH^*)$' are false or (b) both are truth-value-less. Since some relaxed Russellians differ with strict Russellians on the semantics of 'that Jekyll is Hyde', some may differ with strict Russellians on whether Bayesians can successfully introduce the preceding functor 'p'. Finally, footnote 8 (omitted above) discusses my comment (Braun 2006a) on Chalmers 2006. This note may suggest to some readers that I hold a hidden-indexical, relaxed Russellian view about sentences (i) and (ii). I did mention such a view in my comment, but my own views are strict Russellian.

5. Chalmers's theory of the objects of belief and credence

Though Chalmers argues against referentialism (and Russellianism) for the objects of belief and credence, his own theory of these objects is surprisingly similar in structure to Guise Russellianism. Chalmers initially argues (pp. 618-28) that the things in the domains of credence functions are *primary intensions* (which I describe below). But after he considers further constraints on the things in the domains of credence functions (pp. 628-32), he concludes that they are *enriched propositions*. Enriched proposition are amalgams of *structured* primary intensions (described below) and Russellian propositions; each enriched proposition determines an ordered pair of a structured primary intension and a Russellian proposition (pp. 629-33). The structured primary intension determined by an enriched proposition plays the same role in Chalmers's theory of rational flat-out belief and partial belief that guises do in Russellians' theories. For instance, Russellians hold that guises largely determine the rationality of an agent's flat-out belief. Chalmers analogously holds that the structured primary intensions associated with enriched propositions largely determine the rationality of an agent's flat-out belief. Russellians hold that a rational agent's credence function can map two proposition-guise pairs to two different numbers, even if the two pairs contain the same Russellian proposition, as long as the guises are different and suitably (un)related. Chalmers analogously holds that a rational agent's credence function can map two different enriched propositions pairs to different numbers, even if the two enriched propositions determine the same Russellian proposition, as long the two enriched propositions determine structured primary intensions that are different and suitably

28

(un)related. So, the structured primary intensions determined by enriched propositions play the same role in Chalmers's theory as guises do in Russellian theories.[18]

None the less, Chalmers seemingly believes that his theory is superior to the Russellians'. But his theory is superior only if structured primary intensions can play the above-described role. I will argue that there are good reasons to doubt that they can. I will also argue that there are no comparably serious reasons to doubt that Russellian guises can.

Let us begin with Russellian guises. As I said earlier, some Russellians remain neutral about their nature. But Russellians who say more about them usually take them to be mental representations with sentence-like constituent structures. On such a view, x is a guise of proposition P for agent A iff two conditions hold. First, A bears the right sort of psychological relation to x: for instance, x has the right sort of functional or cognitive role for A. Second, the content of x for A is P. (On this view, guises are not contents, but rather bearers of contents.) The content of x for A is P only if x has constituents which are also guises for A, and the contents of those guise-constituents for A are the constituents of P. For instance, if x is a guise, for A, of the proposition that Jekyll/Hyde has dreadfulitis, then x has a guise-constituent whose content for A is Jekyll/Hyde and also a guise-constituent whose content for A is the property of having dreadfulitis. Those constituents of x have those contents for A because they bear the right sorts of causal/historical relations to Jekyll/Hyde and instances of the disease. Agent A believes, or partially believes to a certain degree, the propositional content of guise x iff A stands in the right sort of cognitive relation to x (in addition to standing in the cognitive relation to x required for x to be a guise for A). The degrees to which A d-believes propositions, under guises, determine how she is disposed to bet on sentences, such as 'Jekyll has dreadfulitis' and 'Hyde has

---

[18] Structured primary intensions also play the same role in Chalmers's *semantic* theory of belief attributions that guises do in *relaxed* Russellian semantic theories. But I will not be discussing the semantics of belief attributions below.

29

dreadfulitis'. Agent *A* may be disposed to bet on these sentences differently, because she entertains the proposition that Jekyll/Hyde has dreadfulitis under two different guises when she hears those sentences, and she d-believes that proposition to different degrees under those two guises.

That is a typical Russellian view about guises. Russellians who hold it engage in some psychological speculation. But it is reasonably plausible speculation—as plausible as much speculation about mental representation in contemporary cognitive science. And it is mild compared to Chalmers's speculations about primary intensions, which I describe below.

Chalmers wants the domains of credence functions to be contents, meanings, or sets of possibilities of some sort (but not typical Russellian guises, for these are not contents). He wants this because he wants to associate sets of possibilities with sentences in idiolects, and he wants such sets because he thinks it 'is required in order to use the full explanatory apparatus of the probabilist in the analysis of credences' (p. 612). [19] Chalmers moreover wants to associate different contents and sets with the sentences 'Jekyll is Jekyll' and 'Jekyll is Hyde' in Olivia's idiolect, since she bets on these differently. But the sets of metaphysically possible worlds at which these sentences are true are the same, so he cannot use these sets to assign them different contents. Instead, Chalmers associates *primary intensions* with sentences in Olivia's idiolect. [20] Primary intensions of sentences are functions from *epistemic scenarios* to truth values. Chalmers

---

[19] Chalmers says nothing further about the 'full explanatory apparatus', but it presumably involves the use of set-theory and algebra. Chalmers goes on to say 'This requirement does not require that the objects *be* sets of possibilities. . . But they must determine such a set, and we must be able to associate credences with such sets' (p. 612). However, Chalmers later suggests (p. 629) that the credence functions of non-ideal agents operate on enriched propositions, which are not sets of possibilities. He also says that two enriched propositions may be associated with two different credences, and yet determine the same set of possibilities. So moving to enriched propositions would force Chalmers to abandon the apparatus that exploits sets, and would also force him to give up associating an agent's credences with sets of possibilities.

[20] More accurately, he associates primary intensions with *assertions* (acts of asserting), so as to avoid difficulties raised by context-sensitive sentences (p. 593). We can ignore this refinement here, because we will not be discussing context-sensitive sentences.

usually takes epistemic scenarios to be metaphysically possible *centered* worlds, which we can model with triples consisting of a metaphysically possible world w, an individual that exists at w, and a time in w (p. 615). Chalmers thinks that certain facts about Olivia determine the primary intension that 'Jekyll is Hyde' has in her idiolect. However, his views about the facts that determine the primary intension, and how they do so, are not entirely settled, so his discussion leaves open various options. I describe his main line of thought below.

Chalmers (usually) says that the primary intension associated with 'Jekyll is Hyde' in Olivia's idiolect is determined by how she would bet, under certain conditions, on certain complex sentences used to make *conditional bets*. Suppose that $S(w)$ is a complete description in Olivia's idiolect of a centered world w. Suppose we asked her to consider, and bet on, the sentence 'Jekyll is Hyde, given that $S(w)$'. Suppose we make sure that she understands that this is a conditional bet (a bet that is off if $S(w)$ is false: see p. 620). Chalmers stipulates (p. 620) that if she were to take such a bet to be a 'sure thing' (to have a probability of 1) then the primary intension associated with 'Jekyll is Hyde' in her idiolect yields truth when applied to w (and conversely). The conditional bets she would make, under certain conditions, on *all* sentences of the form 'Jekyll is Hyde, given $S(w)$', for all scenarios w, determine the primary intension of 'Jekyll is Hyde' in her idiolect.

But there are complications. Sentence $S(w)$ cannot include all sentences in her idiolect that are true at w, for if it did, then $S(w)$ would include 'Jekyll is Hyde'. In fact, 'Jekyll is Hyde' would be included in all descriptions of all epistemic scenarios, since 'Jekyll is Hyde' is true at all metaphysically possible worlds, and the worlds of epistemic scenarios are metaphysically possible worlds. But then the primary intension associated with 'Jekyll is Hyde' would be the same as that associated with 'Jekyll is Jekyll', for the latter is also true at all scenarios. So we

31

must use a restricted vocabulary for the description $S(w)$ of scenario w. Chalmers (p. 619) says that the restricted vocabulary must exclude all proper names, natural kind terms, context-sensitive terms, terms used deferentially, and all other terms that generate apparently *a posteriori* identities. The description must also exclude all 'twin-earth-able' terms (p. 619, note 14).[21] Chalmers speculates that such descriptions could include 'causal, mental, spatiotemporal, logical, and mathematical vocabulary, along with microphysical vocabulary (either explicitly or implicitly via Ramsey sentences in the other vocabulary)' (p. 620). Whatever the vocabulary, $S(w)$ must state the complete truth about w that can be stated in that vocabulary. Clearly, $S(w)$ would be very long and complicated, if w is a typical world . So, Chalmers also says that we must consider how Olivia would bet on 'Jekyll is Hyde, given $S(w)$' under conditions of *ideal rational reflection*, in which all contingent cognitive limitations on her memory and reasoning ability are removed, and she can engage in arbitrarily long and difficult *a priori* reasoning (p. 621). Moreover, $S(w)$ may include vocabulary that Olivia does not actually have, so we must also suppose that, under ideal conditions, she does possess that vocabulary (p. 620).

Does Chalmers's method determine a primary intension for 'Jekyll is Hyde' in Olivia's idiolect, on which her credence function could yield a reasonable value? I doubt it, for two reasons. [22] The first reason has to do with Chalmers's restricted vocabulary for describing epistemic scenarios. There is a large philosophical literature (beginning with Kripke 1980, Putnam 1975, and Burge 1979) that strongly supports the conclusion that nearly all terms are

---

[21] Chalmers suggests that the vocabulary allowed in $S(w)$ need not be so austere, so long as his principles of Plenitude and Scrutability hold for a given choice of vocabulary (p. 620). But if the odds at which Olivia would bet on 'Jekyll is Hyde, given that $S(w)$' change from one choice of vocabulary to another, then the primary intension associated with 'Jekyll is Hyde' in her language would also change from one choice of vocabulary to another, and the primary intension of the sentence would have to be relativized to choice of vocabulary. That seems undesirable, for Chalmers's purposes, for her propensity to bet on 'Jekyll is Hyde' remains the same.

[22] The objections I express in this paragraph and the next are in the same neighborhood as many other objections to Chalmers's two-dimensionalism. See, for instance, Block and Stalnaker 1999, Byrne and Pryor 2004 and Soames 2005.

used deferentially, nearly all can give rise to Frege cases, nearly all can generate *a posteriori* identities, and nearly all are twin-earth-able. If this conclusion is right, then very few terms, if any, satisfy Chalmers's requirements for his restricted vocabulary. Nearly all vocabulary items of the sorts that Chalmers mentions in the quote from the previous paragraph fail his criteria, including, for instance, the *non*-natural kind terms 'pail' and 'bucket', all names of the name 'Jekyll', and the terms 'cause', 'intend', 'believe', 'sensation', 'red', and 'π'. Therefore, it is likely that for all worlds w, $S(w)$ contains an extremely sparse vocabulary, and so Olivia would be unsure whether 'Jekyll is Hyde' is true in w when w is described with $S(w)$ (even if she were given unlimited memory, unlimited time to reason, and so on, as required by Chalmer's conditions of ideal reflection, and assuming that there is some fact of the matter about what judgment she would make in such conditions—more about this below). So, for (nearly) all w, if she assigned any probability to a sentence of the form 'Jekyll is Hyde, given that $S(w)$' in Chalmers's ideal conditions, she would assign it a probability close to .5, reflecting her agnosticism. Therefore, if we followed Chalmers's method for assigning primary intensions to sentences in her idiolect, the primary intension of 'Jekyll is Hyde' would be falsehood at all scenarios. The same would happen with 'Twain is Clemens', 'Barack Obama is George W. Bush', and many other sentences in her language: they would have the same (trivial) primary intension. But since Olivia (in fact) assigns different probabilities to different sentences of this type, primary intensions cannot play the guise-like role (described at the beginning of this section) that Chalmers wants them to play.

Even waiving this concern about the vocabulary in $S(w)$, we should have worries about Chalmers's ideal conditions for making conditional bets. Chalmers assumes that (nearly always) there is a determinate fact of the matter about which bets Olivia would make on complex

33

conditional sentences under Chalmers's conditions of ideal rational reflection, in which she has

new vocabulary, and contingent limits on her memory and reasoning ability are removed, and

she can engage in arbitrarily long and complex *a priori* reasoning. In particular, he seemingly

thinks that for nearly all scenarios *w*, there is exactly one degree *n* such that, if Olivia were to

consider 'Jekyll is Hyde, given that $S(w)$' under his ideal conditions, she would assign that

sentence degree *n*, and make conditional bets accordingly. But is there exactly one such *n*?

Removing *contingent* limits on Olivia's memory and reasoning abilities may not enable her to

engage in arbitrarily long and complex *a priori* reasoning, for it may be metaphysically

impossible for her to have that ability. If so, then there is no single degree *n* such that, if (*per*

impossibile) she were able to engage in arbitrarily long *a priori* reasoning and she considered

'Jekyll is Hyde, given that $S(w)$', she would assign *n* to that sentence. [23] Even supposing it is

metaphysically possible for her to have unlimited memory and to engage in arbitrarily long *a*

priori reasoning, she would have to be drastically different from how she actually is to have

these abilities. If so, there may be no actual fact about her that determines the following: there is

a single *n* such that if she were to consider 'Jekyll is Hyde, given that $S(w)$', and she were as

drastically different from how she actually is as Chalmers proposes, then she would assign the

sentence a probability of *n*. Rather, if she were so drastically different, she *might* assign the

sentence a probability of *n*, but she *might* equally well assign it a substantially different

probability *m*. (Compare: There is no actual fact about Verdi and Bizet which determines the

following: there is a nationality such that if Verdi and Bizet were compatriots, then they *would*

both have that nationality. Rather, if they were compatriots, they *might* both be French, but they

---

[23] Standard theories of counterfactuals say that all counterfactuals with metaphysically impossible antecedents are vacuously true. If these theories are correct, and it is metaphysically impossible for Olivia to satisfy Chalmers's ideal conditions, then *every* counterfactual of the following form is true, for all values of '*n*': ⌈If Olivia were to bet on 'Jekyll is Hyde, given that $S(w)$' under conditions in which she can perform arbitrary amounts of *a priori* reasoning, her betting behavior would indicate that she thinks it has probability *n*⌉.

might equally well be Italian instead.) If this is right, then Chalmers's method does not determinately assign a single primary intension to 'Jekyll is Hyde' in her idiolect.[24]

I have been discussing Chalmers's theory of primary intensions. His ultimate theory of the objects of belief and credence uses *structured* primary intensions. The structured primary intension associated with a sentence, in an idiolect, is a structured entity whose constituents are the primary intensions associated with the words in the sentence. But if we have any doubts about primary intensions, then we should have at least equally strong doubts about structured primary intensions.

You might have worries about Russellian psychology and Russellian guises, and so have worries about Russellian credence functions defined on proposition-guise pairs. But your worries about guises should be mild compared to your worries about primary intensions and credence functions defined on enriched propositions.

6. Conclusions

Let us review. There are familiar objections to Russellianism about (flat-out) belief that appeal to certain principles of rational belief, such as the Modus Ponens Principle. Russellians have replied to those objections by denying the principles of rational belief on which they rely, and replacing those principles with analogous ones that use guises and relations among agents, propositions, and guises. Chalmers has presented parallel objections to Russellian theories of partial belief; these objections appeal to certain Bayesian principles of rational change in partial belief. There is an entirely parallel Russellian reply that denies those principles, and replaces them with analogous ones that use guises and relations among agents, propositions, guises, and numbers. The Russellian replies to Chalmers's Bayesian objections are just as plausible as the Russellian

---

[24] Chalmers and Jackson (2001) and Chalmers (2012) argue for determinacy. I cannot address their arguments here.

35

replies to the earlier objections concerning rational flat-out belief. So, Chalmers's Bayesian objections do not raise substantially new problems for Guise Russellians.

Chalmers's own theory of the objects of belief and credence is structurally similar to the Guise Russellian's theory, for structured primary intensions play the same role in Chalmers's theory that guises do in the Russellian's theory. But Chalmers's theory of (structured) primary intensions is speculative and dubious. There are no comparably serious problems with typical Russellian theories of guises. [25]

References

Block, Ned and Robert Stalnaker 1999: 'Conceptual Analysis, Dualism, and the Explanatory Gap'. *Philosophical Review* 108, pp. 1-46.

Braun, David 1998: 'Understanding Belief Reports'. *Philosophical Review* 107, pp. 555-95.

Braun, David 2000: 'Russellianism and Psychological Generalizations'. *Noûs* 34, pp. 203-36.

Braun, David 2001a: 'Russellianism and Explanation'. *Philosophical Perspectives* 15, pp. 253-89.

Braun, David 2001b: 'Russellianism and Prediction'. *Philosophical Studies* 105, pp. 59-105.

Braun, David 2006a: 'Comment on David Chalmers's "Probability and Propositions"'. Paper

presented at the Online Philosophy Conference, May 2006.

http://www.acsu.buffalo.edu/~dbraun2/Research/braunonchalmers.pdf , accessed 14 June 2012

Braun, David 2006b: 'Illogical, But Rational'. *Noûs* 40, pp. 376-79

Burge, Tyler 1979: 'Individualism and the Mental'. *Midwest Studies in Philosophy* 4, pp. 73-121.

Byrne, Alex and James Pryor 2004: 'Bad Intensions'. In Garcia-Carpintero and Macia 2004, pp.

38-54.

Chalmers, David and Frank Jackson 2001: 'Conceptual Analysis and Reductive Explanation'.

*Philosophical Review*110, pp. 315–61.

Chalmers, David 2006: 'Probability and Propositions.' Paper presented at the Online Philosophy

Conference, May 2006. http://consc.net/papers/probability.pdf , accessed 14 June 2012.

Chalmers, David 2011: 'Frege's Puzzle and the Objects of Credence'. *Mind* 120, pp. 587-635.

Chalmers, David 2012: *Constructing the World*. Oxford: Oxford University Press.

Crimmins, Mark 1992: *Talk About Beliefs*. Cambridge, MA: MIT Press.

Crimmins, Mark and John Perry 1989: 'The Prince and the Phone Booth: Reporting Puzzling Beliefs'. *Journal of Philosophy* 36, pp. 685-711.

Garcia-Carpintero, Manuel and Josep Macia (eds) 2004: *The Two-Dimensionalist Framework: Foundations and Applications*. Oxford: Oxford University Press.

Hájek, Alan 2003: 'What Conditional Probability Could Not Be'. *Synthese* 137, pp. 273–323.

Hájek, Alan 2012: 'Interpretations of Probability'. *The Stanford Encyclopedia of Philosophy* [online encyclopedia], Winter 2012 Edition, http://plato.stanford.edu/archives/win2012/entries/probability-interpret/, accessed 20 May 2013.

Hanson, Philip P. (ed)1990: *Information, Language and Cognition*. Vancouver: University of British Columbia Press.

Kripke, Saul 1979: 'A Puzzle About Belief'. In Margalit 1979, pp. 239-283.

Kripke, Saul 1980: *Naming and Necessity*. Cambridge, MA: Harvard University Press

Margalit, A. (ed) 1979: *Meaning and Use*. Dordrecht: D. Reidel.

Perry, John 1977: 'Frege on Demonstratives'. *Philosophical Review* 86, pp. 474-497.

Perry, John 1979: 'The Problem of the Essential Indexical.' *Noûs* 13, pp. 3-21.

Putnam, Hilary 1975: 'The Meaning of "Meaning"'. *Minnesota Studies in the Philosophy of Science* 30, pp. 1-30.

Richard, Mark 1990: *Propositional Attitudes*. Cambridge: Cambridge University Press.

Salmon, Nathan 1986: *Frege's Puzzle*. Cambridge, MA: MIT Press.

Salmon, Nathan 1989: 'Illogical Belief'. *Philosophical Perspectives* 3, 243-285.

Salmon, Nathan 1995: 'Being of Two Minds: Belief with Doubt'. *Noûs* 29, pp. 1-20.

Schiffer, Stephen 1978: 'The Basis of Reference'. *Erkenntnis* 13, pp. 171-206.

Schiffer, Stephen 1987: 'The 'Fido'-Fido Theory of Belief'. *Philosophical Perspectives* 1, pp. 455-480.

Soames, Scott 1987: 'Direct Reference, Propositional Attitudes, and Semantic Content'. *Philosophical Topics* 15, pp. 47-87.

Soames, Scott 1990: 'Belief and Mental Representation'. In Hanson 1990, pp. 217-246.

Soames, Scott 2005: *Reference and Description: the Case against Two-Dimensionalism.*

Princeton, NJ: Princeton University Press.