KNOWLEDGE AS *DE RE* TRUE BELIEF?

PAUL ÉGRÉ

ABSTRACT. Kratzer proposed a causal analysis of knowledge in which knowledge is defined as a form of *de re* belief of facts. In support of Kratzer's view, I think the *de re/de dicto* distinction can be used to integrally account for the *original* Gettier cases, but in contrast to Kratzer, I think such an account does not fundamentally require a distinction between facts and true propositions. I then discuss whether this account might give us a reductive analysis of knowledge as *de re* true belief. Like Kratzer, I think it will not, in particular the distinction seems inadequate to account for Ginet-Goldman cases of causally connected but unreliable belief. Nevertheless, I argue that the *de re* belief analysis allows us to account for a distinction Starmans and Friedman recently introduced between *apparent evidence* and *authentic evidence* in their empirical study of Gettier cases, in a way that questions their claim that a causal disconnect is not operative in the contrasts they found.

1. FACTS VS. TRUE PROPOSITIONS

The view has been proposed by several authors that one way of capturing the difference between knowledge and justified true belief might be in terms of the kind of objects they select for (see Russell 1918, Vendler 1972, Kratzer 2002 among others). The idea is that knowledge selects for *facts*, whereas belief selects for *propositions*. On that view, a fact is more than a true proposition, and to know a fact is more than to merely believe a true proposition. But what does it mean to know a fact, as opposed to believing a true proposition? Kratzer (2002) considers a version of Goldman's 1967 causal account of knowledge, in which knowledge is defined in terms of *de re* belief about some fact:

(1) S knows p if and only if S believes p *de re* of some fact exemplifying p.

Kratzer gives an application of this analysis to Russell's 1912 pre-Gettier scenario, in which a man has a true belief, but which falls short of constituting knowledge:

> "If a man believes that the late Prime Minister's name began with a B, he believes what is true, since the late Prime Minister's last name was Sir Henry Campbell Bannerman. But if he believes that Mr. Balfour was the late Prime Minister, he will still believe that the late Prime Minister's last name began with a B, yet this belief though true, would not be thought to constitute knowledge."

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On Kratzer's analysis, the belief that the late Prime Minister's name begins with a B is true *qua* propositional belief, but the corresponding fact is the fact that Bannerman's name starts with a B. The man simply fails to have the propositional belief he has as a *de re* belief about that fact.

That analysis is suggestive, but it partly begs the question: what is it to have a *de re* belief of some fact? Kratzer in her paper offers to capture facts in a framework of situation semantics. In this short paper, I propose to examine more closely the idea that knowledge could be treated as *de re* belief of some kind, but in a more conservative framework than Kratzer's, and in particular without committing myself to an ontological distinction between facts and true propositions. Like Kratzer, I believe that the *de dicto/de re* distinction is entirely relevant for the analysis of Russell's puzzle, and of Gettier's puzzles, but I think the distinction can be captured entirely in terms of binding and scope mechanisms. I first present an analysis of both puzzles in epistemic logic, and then ask whether we can identify knowledge with *de re* true belief. In agreement with Kratzer, we will see that Goldman's fake barn cases do not seem amenable to an analysis in terms of *de re* true belief alone, and moreover that close kins to Gettier's original cases may also not fall under that account. On the other hand, I will argue that the *de re* analysis casts light on a distinction recently proposed by Starmans and Friedman (2012) between what they call apparent vs. authentic evidence in their empirical study of laymen's judgments about Gettier scenarios.

2. Russell's puzzle and *de re* belief

Let a denote Bannerman, and b denote Balfour. Let S stand for the complex predicate: "having a name starting with a B", and let P stand for the complex predicate: "being a late Prime Minister". Let us assume that both names a and b are part of our man's mental repertoire, like the corresponding predicates. To make things realistic with regard to Russell's scenario, we may assume that our man (let us call him Ralph) believes the propositions expressed by the four following sentences:

(2) a. Pb
b. Sb
c. Sa
d. $\forall x \forall y (Px \wedge Py \supset x = y)$

That is, Ralph believes: "Balfour is a late Prime Minister", "Balfour has a name starting with a B", but also "Bannerman has a name starting with a B", and "at most one person is late Prime Minister". We also suppose Ralph's beliefs to be closed under logical consequence.

To deal with definite descriptions, given a predicate Px I will use $P'x$ as an abbreviation for the complex predicate $Px \wedge \forall y (Py \supset x = y)$. Thus, $P'x$ means that x is the only object satisfying P.[1] One way of representing "Ralph believes that the late Prime Minister is

[1] An alternative would be to use the quantifier $\exists !x$ with its usual meaning, but it would do less service to use it. We could also use a non-Russellian treatment of the definite description altogether. This does

Balfour" is by the following *de dicto* ascription, in which the belief operator scopes above the existential operator:

(3) $B_r\exists x(P'x \wedge x = b)$

Similarly, one can represent "Ralph believes that Balfour's name starts with a B":

(4) B_rSb

From those two ascriptions, it follows by closure that "Ralph believes that the late Prime Minister's name starts with a B", which we can represent as:

(5) $B_r\exists x(P'x \wedge Sx)$

The expression "the late Prime Minister" is read purely *de dicto* here, however. Given (2-c), we also have:

(6) B_rSa

Although Ralph mistakenly ascribes the property of being the late Prime Minister to Balfour, I shall assume that the names "Balfour" and "Bannerman" rigidly denote the same distinct individuals in the actual world and in Ralph's belief worlds (for Ralph does not mistake them for being the same individual, we may suppose he even met both in the past, and keeps distinct representations for each of them). From (6) and from the rigidity assumption, it follows that $\exists x(x = a \wedge B_rSx)$. From the assumption that $P'a$ is true in the actual world, it follows from this that:

(7) $\exists x(P'x \wedge B_rSx)$

That is: "of the actual late Prime Minister [who turns out to be Bannerman], Ralph believes that his name starts with a B".[2] What fails to hold, however, is the following:

(8) $\exists x(P'x \wedge B_r(P'x \wedge Sx))$

That is: "of the late Prime Minister, Ralph believes that he is the late Prime Minister and that his name starts with a B". We can be even more explicit, and see the following to fail:

(9) $\exists x(P'x \wedge Sx \wedge B_r(P'x \wedge Sx))$

That is: "of the late Prime Minister, whose name starts with a B, Ralph believes he is the late Prime Minister and that his name starts with a B". It is easy to construct an epistemic

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not matter for the main point at issue, so long as the scope relations to be discussed in what follows are operative.

[2]I am assuming a standard quantified epistemic semantics, with a constant domain assumption, where for example $w \models \exists xB_sSx$ is true provided some element in the domain of w is such that in every possible world w' compatible with s's belief, that element falls in the extension of S in w'. See Fitting and Mendelsohn (1998) for details.

model of Ralph's situation in which all of the previous assumptions are true relative to the actual world, but where (8) and (9) come out as false.

The comparison between (5) and (9) is instructive: basically, the *de dicto* content of (5) is true in the actual world, but Ralph fails to refer it to the right entity. So Ralph has a correct *de dicto* belief, but an incorrect *de re* belief. Putting them side by side, what we see is a contrast between:

(10) a. $\exists x(P'x \wedge Sx) \wedge B_r \exists x(P'x \wedge Sx)$ (true)
b. $\exists x(P'x \wedge Sx \wedge B_r(P'x \wedge Sx))$ (false)

(10)-a says that Ralph believes a true proposition, whereas (10)-b says that Ralph believes a proposition which is true of some actual objects. Under adequate assumptions, (10)-b entails (10)-a, but not conversely. Prima facie, this looks like a promising way of capturing the difference between an accidentally true belief, referred to the wrong objects in Ralph's belief worlds, and a true belief holding as a fact in virtue of being anchored to the right objects. This difference is obtained without postulating a primitive difference between facts and true propositions, but merely in terms of scope mechanisms.

3. Gettier's puzzles

Two puzzles appear in Gettier's celebrated paper. The first case has a structure very similar to Russell's case, since it also involves a definite description. Smith has "strong evidence that Jones is the man who will get the job, and Jones has ten coins in his pocket" (Gettier 1963). Let us represent what Smith believes by the following sentences:

(11) Gj [Jones will get the job]

(12) Cj [Jones has ten coins in his pocket]

(13) $\forall x \forall y(Gx \wedge Gy \supset x = y)$ [at most one man will get the job]

As it turns out, Smith is the man who will get the job, but also "unknown to Smith, he himself has ten coins in his pocket" (Gettier 1963). Hence the following two sentences hold in the actual world:

(14) Gs

(15) Cs

The following *de dicto* ascription can be made truly about Smith:

(16) $B_s \exists x(G'x \wedge Cx)$ [Smith believes the man who will get the job has ten coins in his pocket]

However, the following *de re* ascription is false given the scenario:

(17) $\exists x(G'x \wedge B_s Cx)$ [of the man who will get the job Smith believes he has ten coins in his pocket]

Parallel to the previous analysis, we can distinguish between the true proposition Smith believes, and the failure of Smith to refer the components of that true proposition to the right objects as follows:

(18) a. $\exists x(G'x \wedge Cx) \wedge B_s\exists x(G'x \wedge Cx)$ (true)
b. $\exists x(G'x \wedge Cx \wedge B_s(G'x \wedge Sx))$ (false)

Hence Gettier's first puzzle too can be captured in terms of scope mechanisms. What about Gettier's second case? In the second case, Smith has some reason to believe that Jones owns a Ford, and he furthermore infers about his other friend Brown, "of whose whereabouts he is totally ignorant", that "either Jones owns a Ford, or Brown is in Barcelona". As it turns out, Brown is indeed in Barcelona, but Jones does not own a Ford. So Smith's beliefs can be represented by the following sentences:

(19) a. Fj [Jones owns a Ford]
b. $Fj \vee Ab$ [either Jones owns a Ford, or Brown is in Barcelona]

Prima facie, Gettier's second case does not appear to rest on a *de re/de dicto* ambiguity. On the other hand, there is a strong analogy between the occurrence of a disjunction under the scope of the belief operator in (19)-a and the occurrence of an existential quantifier in our previous examples, since an existential quantifier is nothing but a generalized disjunction. One way in which we can build a tight parallel with the previous cases is first to observe that the following contrast holds in the scenario. Although the following sentence is true:

(20) $(Fj \vee Ab) \wedge B_s(Fj \vee Ab)$

the following version, in which disjunction takes scope over belief, is false:

(21) $(Fj \wedge B_sFj) \vee (Ab \wedge B_sAb)$

Indeed, the first disjunct is false, since Smith falsely believes Jones to own a Ford; and the second disjunct is false too, since Smith does not have the belief that Brown is in Barcelona. The distinction between those two sentences is exactly congruent with a scope distinction. To make a tighter parallel with our previous representations, one option is to handle disjunction as an existential quantifier ranging over sentences, and to use a truth predicate.[3] The previous two examples are then matched by the following *de dicto* vs. *de re* counterparts:

(22) a. $\exists p(p \in \{Fj, Ab\} \wedge True(p)) \wedge B_s\exists p(p \in \{Fj, Ab\} \wedge True(p))$
b. $\exists p(p \in \{Fj, Ab\} \wedge True(p) \wedge B_s(p \in \{Fj, Ab\} \wedge True(p)))$

[3]It may appear preferable to quantify over propositions, rather than sentences. Nothing substantial hangs on that for present purposes, however. In particular, the present analysis is not committed to sententialism about belief.

(22)-a says that one of the two sentences "Jones owns a Ford", "Brown is in Barcelona" is true, and Smith believes that one of those two sentences is true (this holds in the scenario, since Smith believes "John owns a Ford" to be true). (22)-b too says that one of those two sentences is true, and that Smith believes of that sentence that it is indeed one of those two sentences and that it is true. (22)-b, however, is false, unlike (22)-a, for *Ab* is the only actually true sentence, and of that sentence Smith has not formed the belief that it is true.[4]

4. Ginet-Goldman cases

Both for Russell's problem case, and for Gettier's two cases, we thus have a uniform mechanism which appears to do justice to the intuition of a difference between a merely true belief, and a belief true in virtue of corresponding to a fact. This mechanism, which only involves binding and scope relations, allows us to capture Kratzer's proposed analysis without having to distinguish facts and true propositions. Since the intuition that Russell and Gettier intended to convey is that there is a fundamental difference between justified true belief and knowledge, the question is whether we can equate knowledge with true belief *de re*.

If true belief *de re* is meant to mean a true belief whose truth rests on the right connection to some element in the actual world which makes the belief true, then an argument in favor of this analysis is that we have at least factored in an important externalist component, the one that is arguably missing from so many analyses in which the notion of justified belief is referred only to internal reasons for belief. In all the *de re* logical forms we have proposed, for which the belief ascriptions turned out false, what fails is an adequate connection with the actual *truth-maker* of the proposition believed.

There are two main difficulties for the present account, however. The first is that we may find cases very similar to Gettier's original two cases, but for which failure of a *de re* connection is not clear.[5] Quine (1987, in his entry on "Knowledge") gives the example of people who go on a cruise on November 8, 1918, having just read from a paper the false news that the war was over. They land at their destination three days later, with the belief, now turned true, that the war is over. Should we say that their belief that the war is over on November 11 is not a belief *of the war* that it is over? Admittedly, they misrepresent how long the war lasted, but it seems they linked their false belief on November 8 to most of the same military events and episodes that eventually ended on November 11. What

[4]This account of disjunction will in many cases be too strong. For instance, Brown may see someone in the distance and be fully and correctly justified in believing that it is either Tweedledee or that it is Tweedledum, yet without knowing which (Thanks to T. Williamson for bringing this example to my notice many years ago, in a different context). In such a case, Brown believes neither the proposition that it is Tweedledee nor the proposition that it is Tweedledum, yet by assumption he does know the disjunction. This does not necessarily speak against the adequacy of the analysis of Gettier's case II in (22)-a, however. For if we include the disjunction itself among the set in (22)-b, we could still support an adequate *de re* belief in cases in which knowledge does hold. Uegaki and Marti (2013) propose a semantic analysis of knowledge for disjunctions that does incorporate the disjunction itself among the alternatives triggered by a disjunction. I leave a more detailed discussion of their account for another occasion.

[5]I am indebted to J. Nagel, M. Blome-Tillmann and J. Pryor for pressing this point.

allows us to successfully apply the *de re* analysis in Gettier's original cases may therefore turn on accidental features of those cases (the disjunctive structure of the belief in case II, the clearly wrong reference of the description viewed from the believer's perspective in case I), rather than on essential features.

A second difficulty, emphasized by Kratzer in her paper, is that an analysis of knowledge based exclusively on the notion of true *de re* belief does not appear to be general enough. Besides the original *Gettier* cases (and those like the example just mentioned), there are also *Ginet-Goldman* cases. In Goldman's 1976 scenario (based on a case proposed by Ginet), Henry is traveling across the land and points to a particular building of which he thinks that it is a barn. It turns out the building is a real barn, but that "unknown to Henry, the district he has just entered is full of papier-mâché facsimiles of barns. These facsimiles look from the road exactly like barns, but are really just façades" (Goldman 1976). The intuition in this case is that Henry is simply lucky: Henry has formed a true belief, and that belief has the right connection to its truth-maker, but it fails a reliability condition. Because of that, Kratzer's analysis of knowledge is as follows:

> "S knows p if and only if
> (i) There is a fact f that exemplifies p,
> (ii) S believes p *de re* of f, and
> (iii) S can rule out relevant possible alternatives of f that do not exemplify p."

An observation Kratzer makes is that knowledge ascriptions violating conditions (i) and (ii) are "clearly false", whereas knowledge ascriptions violating condition (iii) are "vulnerable and context-dependent". This observation implies that knowledge ascriptions involve at least two dimensions of evaluation, a dimension of *causal connection* to the right truth-maker, and a dimension of *counterfactual sensitivity* to the truth-maker (basically: if the circumstances had been different, the belief would have varied accordingly).

What Kratzer suggests, moreover, is that a failure along the dimension of causal connection is in a sense more dramatic than a failure along the dimension of counterfactual sensitivity. Whether this is so or not is a difficult question, about which recent experimental studies on laymen's judgments bring conflicting evidence, and about which experts disagree. For example, Starmans and Friedman (2013: 663) write the following about the Ginet-Goldman cases:

> "So although such 'fake barn' cases are often referred to as Gettier cases, they do not feature the disconnect characteristic of most other Gettier cases. And in fact, philosophers themselves are quite divided on whether to attribute knowledge in these cases (e.g., Lycan, 2006; Sosa, 2007; Turri, 2012)."

Their view of the typology of Gettier cases is in support of Kratzer's intuition in this case. Nagel, San Juan and Mar (2013a), on the other hand, acknowledge that Ginet-Goldman cases are a new species of Gettier cases, but they also disagree that the distinction is of fundamental importance to the analysis of Gettier cases in the broad sense (2013b).

My own inclination here is to agree with Kratzer and Starmans and Friedman that Gettier cases in the narrow sense (original Gettier cases) and Ginet-Goldman cases really manipulate distinct dimensions of evaluation. On the other hand, we cannot seek much support from Starmans and Friedman's study in favor of Kratzer's judgment, for what they conclude from their findings is that denials of knowledge in Gettier scenarios are not as sensitive to the causal disconnect between a belief and what makes it true as to the kind of evidence that the belief is formed on. Let us consider their distinction, and see where it leaves us.

5. Apparent evidence and Authentic evidence

Starmans and Friedman (2012) conducted a series of experimental studies which appear to challenge the idea that ordinary ascriptions of knowledge are sensitive to the causal disconnect that features in the original Gettier scenarios. However, they found that ascriptions of knowledge were sensitive to whether an agent's belief was formed based on what they call "apparent evidence" vs. "authentic evidence", but they also found that participants ascribed knowledge in cases involving "authentic evidence" for which such ascriptions were prima facie unexpected. The distinction is explained as follows (Starmans and Friedman 2013: 663):

> "Authentic evidence is informative about how the world actually is when the belief is formed, and basing a belief on authentic evidence necessarily makes the belief true when it is formed. Apparent evidence only appears to be informative about how the world actually is, and basing a belief on apparent evidence does not guarantee that the belief is true when it is formed."

An example of a Gettier case based on apparent evidence which they used in their study is one in which a character named Corey believes that he has a quarter coin from 1936 in his piggy bank. His belief is in fact formed on the basis of the wrong perception of a 1938 coin whose date is hard to read. As it turns out, Corey does have an actual quarter coin from 1936 in his piggy bank, but is not aware of it. The corresponding Gettier case involving authentic evidence is one in which Corey believes he has a coin from 1936 in his piggy bank because he inserted a 1936 coin himself. Unbeknownst to him, there is another quarter from 1936 in his piggy bank. Corey takes a 10 minute nap during which his friend Scott who needs a quarter picks the one Corey has just inserted, leaving the other untouched. In each scenario, the question for which Starmans and Friedman probed participants' judgments was whether, "at the end of the story", Corey "really knows" or "only believes" that there is a coin from 1936 in his piggy bank.

For this pair of scenarios and another such pair, what Starmans and Friedman found was a striking contrast, with an average of 67% of participants attributing knowledge in the Authentic Evidence conditions, vs. only 30% in the Apparent Evidence conditions.[6] The

[6]The contrast was even more pronounced in just one of the two pairs, with 76% vs. 14% of knowledge attribution from Authentic to Apparent condition. From Starmans and Friedman's presentation, this appears to be the "Coin" story, but the text talks of "the first story", and I was not sure whether this is

question for us is: can we capture this difference in terms of the *de re/de dicto* distinction used previously, or is there again a genuinely distinct dimension of evaluation at stake? Consider the following sentence:

(23) Corey believes that there is a coin from 1936 in his piggy bank.

Let us consider our two paraphrases, the *de dicto* paraphrase, and the *de re* paraphrase (with "Cx" for "x is a coin from 1936", and "Px" for "x is in Corey's piggy bank"):

(24) a. $\exists x(Cx \wedge Px) \wedge B_c \exists x(Cx \wedge Px)$
b. $\exists x(Cx \wedge Px \wedge B_c(Cx \wedge Px))$

The *de dicto* ascription (24)-a is true in the two scenarios, the Apparent Evidence as well as the Authentic Evidence scenario. What about (24)-b? Whether in the Apparent Evidence case or in the Authentic Evidence case, the only actual coin from 1936 that is left in the piggy bank at the end of the story is not one about which Corey has any *de re* belief. So in both cases, (24)-b is false *at the of the story*. However, consider the same belief ascription relative to the beginning of the story. At the beginning of the story, (24)-b is this time true in the Authentic evidence case: for Corey has a correct *de re* belief about the coin from 1936 he inserted. But (24)-b is false in the Apparent evidence case.

This observation raises two questions. One is whether participants sufficiently paid attention to the adverbial "at the end of the story" (which does not feature in the target sentence, but right before it). Another, assuming that participants did pay attention to the temporal adverbial as they should have, is how much, toward evaluating the sentence "Corey really knows that there is a coin from 1936 in his piggy bank", the temporal reference of the embedded clause needs to be constrained by the expression "at the end of the story". What could be happening is that participants refer the knowledge state to the correct *de re* belief Corey had *at the beginning of the story*, but then judge it to be reliable enough relative to normal circumstances to count it as knowledge at the end of the story, given the rather exceptional circumstances of the Authentic evidence scenario. If that were the case, it might give support to the idea that knowledge is ascribed in the way suggested by Kratzer: first by checking that the causal condition is satisfied, and then by accepting the belief in question to be reliable *enough* in general, in spite of the abnormal circumstances described.

Whether or not any of these explanations is the case, it remains an interesting observation that we can at least capture the distinction between apparent evidence and authentic evidence proper in terms of the distinction between *de re* and *de dicto* belief. If only for that reason, I think this mitigates Starmans and Friedman's claim that "while people sometimes do deny knowledge in Gettier scenarios, it is not because of the disconnect described above".

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indeed so, or whether this refers to the "Yogurt" Story, which is presented first in the appendix to their paper.

6. Conclusions

My first two conclusions will be to stress lessons from Kratzer's important paper. The first is that an analysis of knowledge in terms of correct *de re* belief accounts surprisingly well for the original Gettier cases. The second, again in agreement with Kratzer, is that the *de re*-belief-of-facts analysis gives us only part of the truth conditions for knowledge. Admittedly, we must prise apart Gettier cases in the strict sense from Ginet-Goldman cases: both manipulate different dimensions of evaluation, and the weight of those dimensions in knowledge attributions remains an open question. A further difficulty we saw is that even setting aside Ginet-Goldman cases, there are cases very much like Gettier's original cases, for which failure of a *de re* connection is not clear.

Let me add two more conclusions: the first is that we did not have to distinguish facts and true propositions to account for the original Gettier cases. It was enough to use mechanisms of binding and scope. This is not to say that thinking of facts as distinct from true propositions is necessarily misguided, but merely to say that we do not have to worry about the definition or construction of facts to account for the Gettier cases. The second point is that we were able to use the *de re/de dicto* distinction about belief to account for Starmans and Friedman's distinction between authentic vs. apparent evidence in their study of Gettier cases. Of course, it remains surprising that knowledge is ascribed to such a large extent for cases of authentic evidence, but at the very least this suggests that some notion of causal connection is still operative in the contrast uncovered by Starmans and Friedman.

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