'That'-clauses as existential quantifiers

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restriction of the domain of quantification. On this view the overall content of the belief sentence 'John believes that Peter is an eye-doctor' is nothing other than

[$\exists p$: TRUE (p) iff EYE-DOCTOR (Peter)] BELIEVES (John, p)

but the variable *'p'* only ranges over beliefs possessing the contextually relevant property *F*.[3]

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References

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[3] Many thanks to Paul Egré, Neftali Villanueva Fernandez and Philippe Schlenker for comments on an earlier version of this paper, and to Claude Panaccio for inspiring the main idea.

is possible, and it might be said that this reading is *'de re'* with respect to the property expressed by 'eye-doctor':

[ιX : X = EYE-DOCTOR] [∃*p* : TRUE (*p*) iff X (Peter)] BELIEVES (John, *p*)

But the problem is that the *other* reading — the *de dicto* reading — has been represented in such a way that it, too, allows substitution. It follows that nothing, in our framework, captures the feature of belief sentences in virtue of which substitution fails even for synonymous expressions.

I think that feature can (and should) be handled pragmatically. On a pragmatic analysis, what the sentence compositionally articulates is only the truth-conditional content of the ascribed belief. At that level, substitutivity does *not* fail. But the context and the way the speaker phrases the report impart extra information regarding the ascribee's belief, and in particular the ways she presumably thinks of the various objects and properties which her belief concerns. Substitutivity fails, when it fails, because the expressions that are used in giving the truth-conditions of the ascribed belief are themselves contextual clues which may affect the further suggestions that are conveyed, but not literally expressed, regarding that belief.

There are two types of pragmatic accounts of opacity in the literature. One type of account says that the information that is 'pragmatically imparted' rather than compositionally articulated does *not* affect the truth-conditions of the report. The truth-conditions which such views ascribe to belief reports are very different from the intuitive truth-conditions which they seem to have, and this, I take it, is a serious defect of those approaches. The other type of account says that the pragmatic suggestions in question find their ways into the truth-conditions of the report. For example, we may argue that the compositionally articulated content of 'John believes that grass is green' is *freely enriched* through the contextual provision of additional ingredients ('unarticulated constituents') in the restriction of the quantifier — ingredients which I represent by means of the extra conjunct '*F* (*p*)', in which *'F'* is a free variable:

[∃*p* : (TRUE (*p*) iff EYE-DOCTOR (Peter)) & *F* (*p*)] BELIEVES (John, *p*)

Intuitively, the property *'F'* that is implicitly ascribed to John's belief is the property that its propositional constituents are thought of under such and such modes of presentation.

If, for general methodological reasons, one does not like 'free enrichment' or 'unarticulated constituents', an alternative analysis is available which is less controversial but amounts to exactly the same thing. The alternative analysis appeals to the universally accepted idea of a contextual

which would be my rendering of (the *de dicto* interpretation of) 'John believes that grass is green' if 'iff' was construed as material equivalence, 'GREEN (grass)' can be replaced by any materially equivalent formula (e.g. 'WHITE (snow)') without affecting the truth-value of the whole. That is not acceptable, for we cannot substitute 'snow is white' for 'grass is green' in 'John believes that grass is green'.

The belief operator 'John believes that' posited by the Hintikka-Prior analysis is intensional; it operates on the content of the complement sentence, not on its extension. It follows that only a sentence expressing the same proposition as the sentence 'grass is green' can substitute for it in 'John believes that grass is green'. In the standard framework, the same result is achieved by extensional means: the 'that'-clause 'that grass is green' is taken to designate the content of the complement sentence 'grass is green', hence only a sentence with the same content as 'grass is green' can be substituted for it without modifying the reference of the 'that'-clause. To achieve that effect in our framework, we have to make the connective 'iff' suitably intensional, i.e., sensitive to the content of the sentence on the right-hand-side, and not merely to its extension (its truth-value). Indeed, when we say that what the speaker believes is true if and only if grass is green, we describe a state of affairs, consisting of a certain object (grass) having a certain colour (green), and we say that the belief is true in all and only those situations in which *that state of affairs* obtains. The situations in question may be partial, so even strict equivalence (equivalence in all possible worlds) will not do. Which of the many proposals available in the logico-philosophical literature best captures the intuitive content of 'if and only if' is an issue which I will not address in this paper. I use the symbol 'iff' as a place-holder, to record the need for a suitably intensional connective.

IV.

One might object that, even if we had such a connective, we still couldn't account for substitutivity failures in belief sentences. The sentence 'John believes that Peter is an eye-doctor' will be rendered as:

$$[\exists p : \text{TRUE}(p) \text{ iff EYE-DOCTOR (Peter)}] \text{ BELIEVES (John, } p)$$

Since 'EYE-DOCTOR' has the same content (expresses the same property) as 'OPHTALMOLOGIST', substitution is possible. Yet in the natural language sentence 'John believes that Peter is an eye-doctor', substitution is blocked: John may fail to realize that Peter is an ophtalmologist even if he believes him to be an eye-doctor.

It will not do to appeal to the *de re/de dicto* distinction here. To be sure, there is a reading of the natural language sentence in which substitution

[$\exists p$: TRUE (p) iff GREEN (grass)] BELIEVES (John, p)

In this framework, semantic innocence is preserved as much as it is in Davidson's paratactic analysis: the sentence 'grass is green' makes its standard contribution and is not recruited as a fragment of a complex name. The standard view is rejected because (2) is rejected. But no discrepancy is introduced between grammatical form and logical form. As for the above-mentioned inferences, they can be accounted for quite easily:

John believes that grass is green,
Sam doubts whatever John believes,
Therefore, Sam doubts that grass is green

is now formalized as

[$\exists p$: TRUE (p) iff GREEN (grass)] BELIEVES (John, p)
[$\forall p$: BELIEVES (John, p)] DOUBTS (Sam, p)
[$\exists p$: TRUE (p) iff GREEN (grass)] DOUBTS (Sam, p)

The *de re/de dicto* distinction also can easily be captured. The two readings of a belief sentence with an embedded definite description, for example,

John believes that the winner is African

will be represented respectively as

[de re reading]

[ιx : WINNER (x)] [$\exists p$: TRUE (p) iff AFRICAN (x)] BELIEVES (John, p)

and as

[de dicto reading]

[$\exists p$: TRUE (p) iff [ιx : WINNER (x)] AFRICAN (x)] BELIEVES (John, p)

III.

In the above formulas I have used the symbol 'iff' without saying which logical connective it stands for. One thing is sure: the connective in question cannot be material equivalence. If it were, we would fail to capture an essential property of belief sentences. In

[$\exists p$: TRUE (p) $\equiv$ GREEN (grass)] BELIEVES (John, p)

she has a belief with certain truth-conditions, that is, a belief that is true iff such and such is the case. We can therefore analyse 'John believes *that grass is green'* as 'John believes *something that is true iff grass is green'* (Panaccio 1996: 266-7). This means that we can treat a 'that'-clause as, in effect, a restricted existential quantifier, and paraphrase it as 'For some p such that p is true iff S' (where *'p'* now is an *objectual* variable ranging over truth-evaluable entities, and 'S' stands for the sentence embedded in the 'that'-clause). 'John believes that grass is green' is therefore equivalent to

$$[\exists p : \text{TRUE}\ (p) \text{ iff GREEN (grass)}]\ \text{BELIEVES (John, } p)$$

that is, 'for some p such that p is true iff grass is green, John believes p'.

The semantic contribution of a quantified noun phrase is standardly treated as a higher-order property, predicated of the property expressed by the nuclear sentence. Similarly, the semantic contribution of 'that grass is green' in 'John believes that grass is green' can be viewed as a higher-order property, predicated of the property expressed by 'John believes ξ'. That higher-order property is the property a property has when it is possessed by at least one entity true iff grass is green. It can be represented as

$$\lambda X\, \lambda x\, [(\exists p : \text{TRUE}\ (p) \text{ iff GREEN (grass)})\ X\ (x, p)]$$

This, then, is the semantic content of 'that grass is green'.[2] To get the content of 'believes that grass is green' we apply that higher-order property to the first-order relation that is the semantic content of 'believes':

$$\lambda X\, \lambda x\, [(\exists p : \text{TRUE}\ (p) \text{ iff GREEN (grass)})\ X\ (x, p)]\ (\text{BELIEVES})$$

What we thereby get is a property of individuals, namely the property of believing something that is true iff grass is green:

$$\lambda x\, [(\exists p : \text{TRUE}\ (p) \text{ iff GREEN (grass)})\ \text{BELIEVES}\ (x, p)]$$

When this first-order property is applied to John, we get

$$\lambda x\, [(\exists p : \text{TRUE}\ (p) \text{ iff GREEN (grass)})\ \text{BELIEVES}\ (x, p)]\ (\text{John})$$

that is,

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[2] To get the semantic content of 'that', we need only to add another lambda abstractor and to replace the formula 'GREEN (grass)' by a sentential variable:

$$\lambda \sigma\, \lambda X\, \lambda x\, [(\exists p : \text{TRUE}\ (p) \text{ iff } \sigma)\ X\ (x, p)]$$

of inference, I have suggested handling it by appealing to sentential quantification, along the following lines:

John_believes-that (grass is green)
$\forall p$ (John_believes-that (p) $\rightarrow$ Sam_doubts-that (p))
Sam_doubts-that (grass is green)

I still think Davidson's paratactic analysis and the Prior-Hintikka analysis fare better than the standard view in certain respects. The standard view treats 'that'-clauses as complex names referring to propositions, and that arguably threatens semantic innocence.[1] On both the Davidson and the Prior-Hintikka view, the embedded sentence is *not* treated as a fragment of such a name, but it remains a *bona fide* sentence — hence innocence is preserved. Yet I am worried by the disappearance of 'that'-clauses, which is a consequence of their analyses. The disappearance of 'that'-clauses introduces an unwelcome discrepancy between grammatical form and logical form. As far as the *grammar* is concerned, there isn't much doubt that 'that'-clauses exist, and that their behaviour is (to some extent) similar to that of noun-phrases. This, it seems, argues in favour of the standard view.

Or does it? An intermediate position may be available. One can acknowledge the grammatical status of 'that'-clauses as noun-phrases (or, more accurately, as complementizer phrases similar in many respect to NPs), while resisting the innocence-damaging claim that they are referential expressions. To give a trivial example, quantified noun-phrases such as 'most children in the park' are noun-phrases, but they are not referential expressions. Therefore it is worth considering what would result if we decided to treat 'that'-clauses on the same pattern. In this way we could acknowledge the grammatical reality of 'that'-clauses, without accepting the standard view and its unwelcome consequences.

II.

Can 'that'-clauses be considered as quantified phrases? Why not? To say that someone believes something is to say that she has a belief with a certain content. To ascribe a content to a belief is to ascribe it certain truth-conditions. Therefore, to say that someone believes something is to say that

[1] For me 'semantic innocence' covers not only the requirement of semantic constancy, but also a requirement of syntactico-semantic correspondence : expressions of distinct grammatical categories should make semantic contributions of different types. I am indebted to Paul Egré for discussion of this point, both in conversation and in writing (Egré forthcoming). Thanks also to Neftali Villanueva.

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I.

The following assumptions jointly constitute the *standard view* regarding the logical form of belief reports:

(1) 'believe' and other propositional attitude verbs denote relations between an agent and a truth-bearing entity (a 'proposition');
(2) 'that'-clauses are referential expressions which denote propositions.

On this view 'John believes that grass is green' has the form *aRb*. The name 'John' and the 'that'-clause 'that grass is green' are both referential expressions, whose respective denotata fill the two argument-places in the relation denoted by the verb. In this way we can account for the validity of inferences such as

John believes that grass is green,
Sam doubts whatever John believes,
Therefore, Sam doubts that grass is green.

This is formalized as

BELIEVES (John, that_grass_is_green)
$\forall x$ (BELIEVES (John, x) $\rightarrow$ DOUBTS (Sam, x))
DOUBTS (Sam, that_grass_is_green)

Several philosophers have expressed dissatisfaction with the standard view, on various grounds. Two alternatives have been put forward. One is Davidson's paratactic theory, which rejects (2). Davidson analyses attitude reports like 'John believes that grass is green' as consisting of two juxtaposed sentences: 'John believes that' (where 'that' is a demonstrative), and 'grass is green'. The second alternative, advocated by Prior and Hintikka, treats 'John believes that' as a sentential operator analogous to modal operators both syntactically and semantically. On this view, not only are 'that'-clauses deprived of any linguistic reality (as on Davidson's analysis), but the verb 'believes' itself is no longer treated as denoting a first-order relation. Hence both (1) and (2) are rejected.

I am among those who have expressed dissatisfaction with the standard view, and in my book *Oratio Obliqua, Oratio Recta* I have argued in favour of the Prior-Hintikka sort of view. Regarding the above-mentioned type