Structured Propositions and Complex Predicates*

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Propositions are often characterized as the entities that play certain roles in philosophy of language and metaphysics. They are said to be the things expressed by sentences in virtue of which they “say the same thing” and are true or false. They are the things we doubt, believe and know. They are the things that are necessary or contingent, and that ought or ought not to be the case. Saying only this much is not yet to say anything about the nature of the entities—propositions—that in fact play these various roles.

Of course there are various proposals in the current literature as to what things play these roles and hence are propositions. Some claim they are sets of possible worlds (or functions from worlds to truth values). Others claim they are complex entities with structures rather like the structures of the sentences expressing them. Still others hold different views.1

To my mind the second view mentioned above—the view that propositions are complex, structured entities—is the best view of propositions currently available. Advocates of this view have given powerful arguments to the effect that these structured entities are best suited to play the roles that propositions have been held to play. Soames [1987], for example, makes a good case for the claim that complex, structured entities are better suited to be objects of the attitudes than are sets of worlds (or circumstances).

In any case, the purpose of the present work is not to directly defend the claim that propositions are structured. Assuming this general approach is correct, I wish to defend a view about what structured propositions are. In particular, I wish to defend a view about the relations that obtain between constituents in structured propositions and provide the structure to structured propositions. As I shall put it, I wish to defend a view about propositional structure.

I shall show that the account of propositions that results from my account of propositional structure has two highly desirable features. First, it is virtually
undeniable that propositions as I shall construe them exist. Second, my account makes comprehensible how propositions manage to represent the world. It seems to me that these results are important. For many philosophers, even while acknowledging the variety of phenomena explicable on the assumption that propositions exist, are loath to embrace propositions for fear that there are no such things (or that there are no independent reasons for supposing there are such things). In addition, many find the idea that propositions represent the world obscure and inexplicable. Meeting these worries, then, should go a long way towards disarming the opponent of propositions.

Finally, I shall argue that the account of the propositional contribution made by complex predicates that falls out of the account of propositions discussed here has a number of attractive features.

I mentioned that I would not directly defend the claim that propositions are structured entities. Nonetheless, the present work constitutes an indirect defence of the structured proposition approach, or at least a challenge to theories of propositions according to which they are not structured. For it is hard to imagine such a theory having the virtues of the version of the structured proposition approach outlined here.

On the sort of view I favor, sentences (or something like them—more on this in a moment) are the syntactic input to the rules of semantic interpretation. These rules map the syntactic inputs to structured propositions. The second tier of our semantics is a definition of truth for propositions. Prior to discussing structured propositions themselves, it will serve us well to discuss the syntactic inputs to semantics.²

The theories that presently dominate thinking in syntax, current versions of Chomsky’s Extended Standard Theory, suppose that the syntactic representations that are the inputs to semantic interpretation (henceforth SI’s) are in general distinct from the surface structures of sentences. The idea is that certain syntactical transformations apply to surface structures (or something pretty close to surface structures) yielding syntactic representations that are distinct from the surface structures to which these transformations applied. These syntactic representations are then interpreted by the semantic component. It would be impossible to do justice here to the reasoning that has lead syntacticians to suppose that the syntactic inputs to semantics are distinct from the surface structures of sentences.³ However, I wish to emphasize that the view that SI’s are distinct from surface structures is defended by syntacticians not on semantic grounds, but on independent syntactic grounds.

Something must be said about what SI’s are like and exactly how they diverge from surface structure representations. I shall assume that SI’s have at least two features. First, I assume that in SI’s the internal structure of the sentence, including the internal structure of any phrase occurring in it, is represented. As is usual, we will use brackets to represent this structure. Thus, for example, we will assume that a sentence such as
1. Glenn hastily left Los Angeles

has as its SI something like

1a. \([\text{[Glenn][hastily][left [Los Angeles]]]}\]

where the brackets capture the internal structure of the sentence including e.g. the internal structure of the verb phrase ‘hastily left Los Angeles’. To say that an SI has structure is to say that the lexical items in it stand in a certain relation that imposes this structure. In the case of 1a, the relation is complex. That is, for ‘Glenn’, ‘hastily’, ‘left’, and ‘Los Angeles’ to stand in this relation in 1a is for e.g. ‘left’ and ‘Los Angeles’ to stand in a certain relation (represented by the brackets around them) and for ‘hastily’ to stand in a relation to the complex consisting of ‘left’ and ‘Los Angeles’ standing in the former relation, and so on. We shall call the (possibly complex) relation in which lexical items stand in an SI underlying a sentence S the sentential relation of S.

The second assumption I make about SI’s is that quantifier scope relations (as well as those of other operators) are explicitly represented and that quantifiers bind variables. This assumption is endorsed by syntacticians working within the Chomskyan tradition mentioned above. Indeed, they hold that the major difference between an SI (called an LF representation within this tradition) and the surface structure from which it was derived is that quantifier phrases are moved leaving “traces” behind that function as bound variables; and the movement results in explicit representation of quantifier scope. So for example, a sentence such as

2. Every skier hates some snowboarder.

has as SI’s both of the following

2a. \([\text{[Every [x skier]] [some [y snowboarder]] [x hates y]]}\]

2b. \([\text{[Some [y snowboarder]] [every [x skier]] [x hates y]]}\]

The scope ambiguity exhibited by 2 is accounted for as a result of the transformations mapping 2 to an SI being able to apply in two different ways yielding 2a and 2b, which are then interpreted differently by the semantic component.

Returning now to our semantic theory and structured propositions, the idea is that the semantics provides a recursive assignment of propositions to SI’s. On the view of propositions presupposed here, propositions are complex, structured entities. As was the case with SI’s, to say that a proposition, say P, is structured is to say that its constituents stand in some relation, call it the propositional relation of P, that provides the structure of the proposition. This means that the
recursive assignment of propositions to SI’s maps one structured entity, an SI, to another, a structured proposition. The view taken here is that all this mapping does is to “replace” each lexical item in the SI with its semantic value. For a simple expression e occurring in an SI, let e* be its semantic value (henceforth sv; for a name, we suppose the sv is its bearer; for a predicate, the appropriate property/relation; for a logical term, the appropriate logical operation). Then a sentence like

3. Mary hit Lisa

whose SI is as follows

3a. [Mary [hit [Lisa]]]

expresses the proposition

3b. [Mary* [hit*[Lisa*]]]

2, which has the two underlying SI’s 2a and 2b, expresses the following propositions:

2c. [[Every* [x skier*]] [[some* [y snowboarder*]] [x hates* y]]]

2d. [[Some* [y snowboarder*]] [[every* [x skier*]] [x hates* y]]]

where every* and some* are relations between sets (or properties). As was suggested, the semantic clauses that map SI’s to propositions simply “substitute” sv’s for lexical items. The result is that the structure of a proposition is identical to the structure of the SI expressing it, (indeed, as we shall see, something stronger can be said).

It is important to be careful about what is meant by the metaphorical claim that the semantic clauses “substitute” sv’s for lexical items in SI’s. In previous work I claimed that this meant that the sentential relation that obtains between lexical items in an SI is identical to the propositional relation that obtains between the constituents of the proposition that SI gets mapped to. On this view, an SI and the proposition it expresses are structured by the same relation (and thus have the same structure) and differ only in that the latter contains the sv’s of the lexical items occurring in the former, rather than containing the lexical items themselves. Though close to the truth, I no longer think this is quite right.

The correct view is best illustrated by representing SI’s in “tree form” rather than by means of embedded brackets. Thus consider the “tree” version of 3a:
This SI is mapped to the following structured proposition (where again e* is the sv of the expression e):

The portion of the proposition labeled R is the very (complex) relation that the words ‘Mary’, ‘hit’ and ‘Lisa’ stand in in the SI that is mapped to the proposition, (i.e. R is the sentential relation of the SI 3c). The portions labeled A, B, and C are the (semantic) relations that the words ‘Mary’, ‘hit’ and ‘Lisa’ bear to Mary, the relation of hitting and Lisa, respectively, (e.g. A presumably is the reference relation holding between ‘Mary’ and Mary). Thus the proposition consists of Mary, the relation of hitting and Lisa standing (in that order) in the following three-place relation: there are lexical items a, b, c that have as their sv’s……, ///// and //#### (respectively) and occur in an SI with sentential relation R as follows:

In other words, the relation that Mary, the hitting relation and Lisa stand in in the proposition 3d (i.e. the propositional relation of 3d) is the result of composing the sentential relation of the SI 3c with the semantic relations ‘Mary’, ‘hit’ and ‘Lisa’ bear to their sv’s, while existentially quantifying over those lexical items.

Note that on this view, it is the sentential relation of the SI that provides all of the significant structure to the proposition that the SI is mapped to. For the propositional relation (the relation the constituents of a proposition stand in) is the composition of this sentential relation with the semantic relations the lexical items bear to their sv’s. And these semantic relations add no structure to the
proposition, but simply extend the nodes where the lexical items occurred in the SI.

To summarize, whereas in previous work I held that the sentential relation, obtaining between lexical items in an SI, is identical to the propositional relation, obtaining between the constituents of the structured proposition the SI is mapped to, I am now claiming that the sentential relation is a component of the propositional relation. To repeat, the propositional relation is the result of composing the sentential relation with the semantic relations lexical items bear to their sv’s and existentially quantifying over the lexical items. The structured proposition consists of the constituents of the proposition standing in this complex relation.

Thus the fundamental thought behind the present view of structured propositions is that the vehicles by means of which propositions are expressed (e.g. English SI’s) consist of entities (e.g. lexical items) standing in relations and that these very relations provide all of the significant structure to the propositions expressed by those vehicles, (these relations being the structurally significant component of the propositional relation).

The vehicles we have considered thus far are SI’s underlying natural language sentences. But, for example, if there are "mental sentences", these too are vehicles for the expression of propositions. And the ("mental sentential") relation obtaining between the "mental lexical items" in the mental sentence provide the significant structure to the proposition in just the way the sentential relation obtaining between the lexical items of the SI did. As in the natural language case, the propositional relation will consist of the composition of the relation between the lexical items in the mental sentence and the semantic relations the mental lexical items bear to their sv’s (again, existentially quantifying over the lexical items).

Now it is an open question to what extent mental sentences express the same propositions as sentences of English, just as it is an open question to what extent sentences of Chinese express the same propositions as sentences of English. This will depend on the sentential relations of the mental sentences and English sentences and on the sv’s of mental and English lexical items. Hartry Field [1978] has remarked that ‘if (as seems to me quite likely) learning a first language involves extending an initial representation system to include an isomorphic copy of the language being learned, then I think it is quite natural to view the isomorphism as establishing a criterion of type-identity between internal tokens and spoken or written tokens.’ If this were so, it would seem that mental sentences and English sentences would express the same propositions. For the type-identity of mental and English tokens would presumably guarantee sameness of sentential relation and sv’s of lexical items for the two sentence tokens. And this suffices for the sentences to express the same proposition.

Thus on the present view, there may be propositions even in the absence of any public natural languages. However, without vehicles that express propositions, whether they be mental sentences or sentences of a public language, there
are no propositions. For on the present view, the propositional relation binding
together the constituents of a proposition is composed of the relation binding
together the lexical constituents of a vehicle expressing it (i.e. the sentential
relation of the vehicle) and the relations connecting the lexical constituents of the
vehicle to their sv’s. For the propositional constituents to stand in this propositional
relation (i.e. for the proposition to exist) is for there to be lexical items that
stand in the relevant sentential relation and that have the propositional constitu-
ents as their sv’s. Thus for propositions to exist, there must be vehicles consist-
ing of lexical items standing in some (sentential) relation, where these lexical
items bear semantic relations to propositional constituents.11 It seems to me
doubtful that such vehicles existed prior to the existence of humans (or other
creatures with internal systems of representation), if for no other reason than that
it is hard to see how lexical items (mental or otherwise) could have borne
semantic relations to sv’s prior to this. In other work I have argued that there is
no serious objection to the claim that prior to the existence of humans (or
whatever) there were no propositions, (and thus, given that propositions are the
things that are true and false, nothing was true or false).12 I only mention here
that this claim does seem to be a consequence of the present view of proposi-
tions.

Now that our view of propositional structure and propositions has been made
clear, let us consider some of the virtues of the view.13 First, only the most
ontologically frugal among philosophers can deny that our propositions exist. For
the existence of SI’s underlying natural language sentences is supported by the
best theories of syntax current linguistics has to offer. Hence anyone who is
convinced by current thinking in syntax has good reason to believe that SI’s with
the properties described exist. And most philosophers believe that names, predi-
cates, transitive verb phrases, and logical terms are associated by means of
semantic relations with individuals, properties, relations and logical opera-
tions.14 But it immediately follows that our propositions exist. For from the fact
that there is a sentence:

Glenn Bunting skis.

whose underlying SI is:

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Glenn Bunting   skis
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where ‘Glenn Bunting’ bears a semantic relation to Glenn Bunting and ‘skis’
bears a semantic relation to the property of being able to ski, it follows that Glenn
and the property of being able to ski stand in the relation of there being lexical
items a and b occurring in an SI in which they stand in the following relation:
such that Glenn is the sv of a and the property of being able to ski is the sv of b. In other words, it follows that the following entity exists:

But this entity just is our proposition! Thus, given very minimal, independently plausible and quite uncontentious assumptions, it follows that our propositions exist.\[15\]

I turn now to the second important feature of our theory: that it enables us to begin to see how propositions represent the world. First, what does it mean to say that propositions represent the world? It seems to me that this means no more than that the world must be a certain way for propositions to be true, (of course, propositions often require only a quite restricted portion of the world to be a certain way). And this in turn means no more than that propositions are true and false in virtue of the way the world is. Thus, if, on the present view, we can explain how/why propositions are true and false in virtue of the way the world is, we will have explained how they manage to represent the world.

To begin to see how propositions represent the world, let us consider the sentence and proposition discussed above:

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For the sentence, and hence the proposition, to be true, in the actual world Glenn must be related to the property of being able to ski in a certain way: he must possess or instantiate the property of being able to ski. Now an initially plausible explanation of how the proposition represents the world is that the proposition represents Glenn as possessing the property of being able to ski in virtue of the fact that the relation that obtains between Glenn and the property of being able to ski in the proposition represents the relation of possessing or instantiating. That is, Glenn and the property of being able to ski stand in a certain relation R in the proposition (R is the propositional relation: it gives the proposition its structure). R represents the relation of instantiating, and thus the proposition represents Glenn as instantiating being able to ski! Of course, this “explanation” of how the proposition represents the world as being one in which Glenn skis is of no help unless we can supplement it with an explanation of how the propositional relation R represents the relation of instantiation.

Not only are we able to provide the latter sort of explanation, at least in broad outline, but essentially such an explanation would be needed for any theory that assigns truth conditions to ‘Glenn skis’, including theories eschewing propositions altogether!

Roughly, the account of how R represents the relation of instantiation runs as follows. Somehow, the activities of proto-English speakers resulted in words of English having the sv’s they have. Accounts as to precisely how this occurred vary. But presumably the ability of humans to detect various objects, properties and relations in their environment, together with their having made various vocalizations, perhaps in the presence of these entities, resulted in words of English having the sv’s they have. However the proper account ultimately goes, it seems to me a similar account can be given of the fact that propositional relations, such as R above, represent relations such as instantiation. For humans were able to determine that objects possess or instantiate various properties; that is, they were able to detect that the relation of instantiation obtained. And presumably, their having made vocalizations consisting of concatenated words, perhaps in the presence of (e.g.) the object that is the sv of the one word instantiating the property that is the sv of the other word, somehow resulted in this concatenation, a sentential relation, representing the relation of instantiation between object and property. Thus sentential relations between words came to stand for relations in much the same way that the words themselves came to stand for objects and relations. Let us say, then, that the sentential relations themselves came to have sv’s and that this occurred in much the way that it occurred in the case of lexical items.

As I suggested at the outset, it seems that any theory that assigns truth conditions to sentences must give a representational role to sentential relations and thus provide the sort of account we have sketched as to how this comes about. For surely any explanation as to why the sentence ‘Glenn Bunting skis’ has the truth conditions it has (is true iff Glenn possesses the property of being
able to ski) will have to hold that a sentence whose words are concatenated in that
way requires for its truth that the sv of the first possesses the sv of the second.
But then it must be this concatenation that is responsible for the requirement that
the former possesses the latter. What else could have made this contribution to
the truth conditions of the sentence?

Thus it seems necessary to hold that somehow sentential relations become
associated with, and in essence represent, other relations. Further we have seen
that the account of how this might have occurred appears no more problematic
than the account of how words came to have their sv’s, (which is not to say that it
is not problematic—but this is a problem we have to solve!). Once we see how
sentential relations came to have this sort of representational role, it is a small
step to explain how propositional relations, such as R above, came to represent
other relations, such as instantiation.

Propositional relations are the result of composing sentential relations and
reference relations (or the relations that hold between lexical items and their sv’s
in virtue of which they are the sv’s of the lexical items), existentially generalizing
over the lexical items. Given that the sentential relation represents some other
relation, such as instantiation, we may suppose that the propositional relation
represents another relation (e.g. instantiation) in virtue of its component senten-
tial relation doing so. We need only suppose that the reference relations, which
when composed with the sentential relations yield the propositional relation, play
no representational role and are “semantically inert”. Thus, the propositional
relation inherits its representational ability from one of its component parts: the
sentential relation.

This should not be surprising. For recall that the sentential relation provides
all the significant structure to the propositional relation and hence to the proposi-
tion. Adding on the reference relations to yield the propositional relations merely
provides linear extensions to the “branches” of the tree that is the propositional
relation. Thus on the present account, the propositional relation inherits its
representative capacity from the relation that is responsible for all the significant
structure of the propositional relation (the sentential relation). This seems quite
reasonable. For we should expect that it is the proposition’s structure, as induced
by the propositional relation, that allows it to represent its constituents as being
configured a certain way in the world. Roughly, by having its constituents
configured a certain way in the proposition, the proposition represents its constitu-
enents as being related in a certain way in the world. But then if, as we have
claimed, the propositional relation is the result of composing two relations and if
one of those relations is responsible for whatever structure the propositional
relation possesses, it should not be surprising that the propositional relation
inherits its representational capacity from that component. For it is that compo-
nent that allows the constituents of the proposition to be configured in a certain
way (i.e. to be structured in one way as opposed to another).

Thus the present account of propositions and propositional relations enables
us to see, at least in outline, how propositions represent the world. To summarize, the account holds that propositions represent the world as being a certain way by the constituents of the proposition standing in the propositional relation and hence being configured a certain way in the proposition. Since the propositional relation represents another relation, say R, that the constituents stand in the propositional relation represents that in the world the constituents stand in R. And we can explain how the propositional relation can represent another relation by noting that we can see, at least in broad outline, how the sentential relation that is a constituent of the propositional relation could have come to represent another relation and why it is plausible to suppose that the propositional relation could have inherited its representational role from this component of it.

Having highlighted some of the virtues of the present account of structured propositions, we turn now to the account of complex predicates that falls out of it. To begin with a relatively simple case, consider once again sentence 3 above and its SI (3a):

3. Mary hit Lisa.
3a. [Mary [hit [Lisa]]]

On the present view of propositions, the proposition expressed by 3a can be represented as follows (where, as before, e* is the sv of the expression e):

3b. [Mary* [hit*[Lisa*]]]

Note that the complex predicate ‘hit Lisa’ does not contribute the (relational) property of hitting Lisa to the proposition expressed by 3/3a. Rather its contribution consists of Lisa and the relation of hitting standing in a relation that is a subrelation of the propositional relation obtaining between the constituents of 3b. It is important to note that the relation that obtains between Lisa and the relation of hitting in 3b counts as part of the propositional relation of 3b, and thus the structure it induces counts as part of the structure of the proposition. Now consider the following sentence and its SI:

4. Every woman hit Lisa
4a. [[Every [x woman]] [x hit [Lisa]]]

As in the previous case, we hold that the proposition expressed by 4/4a has the same structure as 4a, and can be represented as follows:

4b. [[every*[x woman*]] [x hit* [Lisa*]]]

Thus, as was the case with 3 above, the predicate ‘hit Lisa’ contributes to the proposition expressed by 4 a structured entity consisting of Lisa and the hitting
relation standing in a subrelation of the propositional relation of 4b. Again, the
structure resulting from the relation obtaining between Lisa and the hitting relation
in 4b counts as part of the structure of the proposition.

On the present view, for any sentence, quantified or not and regardless of the
complexity of the predicate, that predicate contributes to the proposition expressed
by the sentence a complex entity whose structure is identical to the structure of the predicate (and whose structure counts as part of the structure of
the proposition expressed by the sentence) and whose constituents are the sv’s of
the lexical items occurring in the predicate. This account follows immediately
from our account of propositions. For if propositions have the same structures as the
sentences (SI’s) expressing them, it follows that a sentence containing a
predicate with complex syntactic structure contributes to the proposition expressed
by the sentence a complex entity whose structure mirrors that of the predicate.19

By contrast, structured proposition theorists such as Nathan Salmon apparently
hold that complex predicates in quantified sentences contribute properties
to the propositions expressed by sentences containing them. Thus on such
treatments, the contributions made by such predicates are, from the standpoint
of propositional structure, simple and add no structure to the proposition. To see the
difference between this approaches and ours, consider the following sentence:

5. Every skier has a favorite mountain with a ski run that he/she particularly enjoys.

On Salmon’s [1986] approach, the complex predicate in 5 would be represented
as follows: x(x has a favorite mountain with a ski run that x particularly enjoys).
According to Salmon, this term contributes to the proposition expressed by 5 the
property (or the relevant propositional function—a function from individuals to
propositions) of having a favorite mountain with a ski run that one particularly
enjoys. Call this property $M$. On Salmon’s view, then, the proposition expressed
by 5 has the simple structure $<E,M>$, where $E$ is the contribution made by the
quantifier phrase ‘every skier’.20 As we have seen, the present approach claims
that the proposition expressed by 5 has a much more complicated structure than
this. In particular, the complex predicate (‘has a favorite mountain with a ski run
that he/she particularly enjoys’) contributes to the proposition a complex, struc-
tured entity whose structure counts as part of the structure of the proposition and
is identical to the structure of the complex predicate.21 The constituents of this
complex, structured entity are the sv’s of the lexical items in the predicate. Of
course the definition of truth for propositions (or a definition preliminary to that
definition) will map this complex entity to the appropriate property, (the property
of having a favorite mountain with a ski run that he/she particularly enjoys). Thus
even on the present view, 5 will be true just in case every skier has the property of
having a favorite mountain with a ski run that he/she particularly enjoys. It is just
that, in contrast to Salmon's view, the latter property itself is not a constituent of the proposition.

We might summarize the difference between the views by saying that while on Salmon's view, the proposition contains the appropriate property as a constituent, on the present view the proposition contains a complex, structured entity (whose structure counts as part of the structure of the proposition) that represents the property in question (in the sense that the definition of truth for propositions maps the complex constituent to the property). Of course, two views will assign the same truth conditions to the propositions.22

It seems to me that there are advantages to the present approach according to which complex predicates in quantified sentences contribute to propositions expressed by those sentences complex, structured entities whose structures are identical to the structures of the predicates contributing them, where the structures of these entities count as part of the structures of the propositions. To see one of these advantages, consider the following sentences:

6a. Richard believes that every runner ran 10 kilometers.
6b. Richard believes that every runner ran 6.2137 miles.

Let us assume, what I believe to be true, that the predictates 'ran 10 kilometers' and 'ran 6.2137 miles' pick out the same property: the property of having run a certain distance.23 In spite of this, the embedded sentences in 6a and 6b express different propositions on the present view. For the predicates in those sentences do not contribute the property they both pick out to the propositions expressed by the embedded sentences. Rather they contribute complex, structured entities, which, though they have the same structure (in virtue of the predicates having the same grammatical structure), are distinct in virtue of the predicates containing lexical items with distinct sv's (e.g. '10' vs. '6.2137'; and 'kilometers' vs. 'miles'). The net result is that the predicates contribute complex entities with the same structure but different constituents to the propositions expressed by the embedded sentences. Thus the propositions expressed by the embedded sentences are different, (even though each contains a complex entity that represents a certain property: the property of having run a certain distance; and so each is true just in case every runner possesses the property of having run that distance).

Since on the present view, the embedded sentences express different propositions, it is quite possible for Richard to stand in the belief relation to one proposition and not the other. Thus the present view allows that 6a and 6b may diverge in truth value. And this seems intuitively correct. If Richard falsely believes that a kilometer is half of a mile and is present at a race that he believes to be a ten kilometer race completed by each runner, it seems that 6a is true and 6b is false. On the other hand, any view that holds that complex predicates contribute the property they pick out to propositions expressed by sentences
containing them must hold that the embedded sentences in 6a and 6b express the same proposition, and thus that 6a and 6b cannot diverge in truth value.\(^{24}\)

In general, on the present view any two predicates that differ in grammatical structure or contain lexical items with different sv’s (or both) make different contributions to propositions, even if they pick out the same property (in the sense that the definition of truth for propositions maps the complex entity contributed by each predicate to the same property). Thus, assuming that the predicates in the embedded sentences in the following sentence pairs pick out the same properties, these pairs could be used to make points analogous to the one made with regard to 6a and 6b above:

7a. Sarah believes that every equation on page ten characterizes a circle.  
7b. Sarah believes that every equation on page ten characterizes a set of all points equidistant from a given point.  
8a. Robin believes that every two week period is one fortnight.  
8b. Robin believes that every two week period is fourteen days.\(^{25}\)

It should be clear from what was said above that on the present view the sentences in each of the following sentence pairs express different propositions, even assuming that the predicates in each pair pick out the same property:\(^{26}\)

9a. Alan is a bachelor.  
9b. Alan is an unmarried adult male.  
10a. IBM and Intel have a contract.  
10b. IBM and Intel have an agreement enforceable by law.

For on the present view, the predicates in 9a and 9b make different contributions to the propositions expressed by 9a and 9b, (of course similar remarks apply to 10a and 10b).  
This feature of the present view seems to provide the beginning to a solution of the so-called “paradox of analysis”.\(^{27}\) Some have thought that e.g. if

11a. For all x, x is a brother iff x is a male sibling.

is a correct analysis, then the claim it expresses must be identical to that expressed by

11b. For all x, x is a brother iff x is a brother.

Yet, it has been claimed, there seem to be various differences between 11a and 11b: the former is (let us suppose), and the latter is not, an analysis. Further, the latter is, and the former is not, in some obvious sense trivial. How can 11a
and 11b be different in these (and perhaps other) respects and yet express the same claim?

Resolving these problems completely would require defending a view about what analysis is (e.g. is it concepts, linguistic expressions or some other things that are analyzed?) and what constitutes a correct analysis. Further, we would have to discuss the sense in which 11b but not 11a is trivial. Such issues are beyond the scope of the present work. However, the present view provides a start towards the resolution of these problems. For 11a and 11b express different propositions on the present view in virtue of the fact that the right side of the biconditional of 11a makes a different contribution to the proposition expressed by 11a than the right side of 11b makes to the proposition expressed by 11b. This is so even if, as we are assuming, 11a constitutes a "correct analysis" in the sense that the left and right sides pick out the same property. Providing this sort of principled reason for thinking that 11a and 11b express different propositions constitutes a promising starting point for an explanation as to why 11a constitutes an analysis, whereas 11b does not. For example, we might suppose that a sentence expressing an analysis must be a (universally quantified) biconditional whose left and right sides make different contributions to the proposition expressed by the sentence but pick out the same property. In any case, in virtue of distinguishing between the propositions expressed by 11a and 11b, the present view makes a promising first step towards the explanation of the various differences between 11a and 11b.

Finally, let us turn to a further desirable feature of the present view of the propositional contribution of complex predicates. Though it is controversial whether various predicates do or do not pick out properties, there appears to be good reason to suppose that a certain complex predicate does not pick out a property. Consider the complex predicate 'is a property that doesn't instantiate itself'. If we suppose that the predicate picks out the property of being a property that doesn't instantiate itself, (henceforth I) and that every property instantiates itself or not, we get into trouble. For suppose I instantiates itself. Then I has the property of being a property that doesn't instantiate itself. That is, I doesn't instantiate itself. On the other hand, suppose that I doesn't instantiate itself. Then I has the property of being a property that doesn't instantiate itself. That is, I instantiates itself. Thus we get the result that I instantiates itself iff I doesn't instantiate itself. Hence it would seem that we ought to abandon the claim that I exists and so hold that the complex predicate above does not pick out a property.

Yet this result apparently does not sit well with other phenomena involving the predicate in question. For example, it seems that the following sentence(s) might well be true:

12. Chris believes (doubts/says/etc.) that every property is a property that doesn't instantiate itself.
STRUCTURED PROPOSITIONS 531

For such sentences to be true (assuming that verbs of propositional attitude express two-place relations between individuals and propositions), the embedded sentence must express a proposition. But if the predicate ‘is a property that doesn’t instantiate itself’ doesn’t pick out a property, on views according to which complex predicates contribute the properties they pick out to propositions it is hard to see how the embedded sentence could express a proposition. On the present view, however, the complex predicate contributes a complex entity to the proposition expressed by the embedded sentence. The constituents of this complex entity are the sv’s of the lexical items in the predicate (i.e. the sv’s of ‘property’, ‘instantiates’ etc.). Since the individual lexical items have sv’s, there is nothing defective about the propositional contribution of the complex predicate. It is just that the complex entity that is its contribution does not represent any property! That is, the definition of truth for propositions fails to map this propositional constituent to any property. Of course, this leaves open the question as to whether the proposition expressed by the embedded sentence is false or without a truth value (I assume that it is not true!). Answering this question would involve addressing subtleties that would take us far afield. For present concerns, the important point is that the present view allows attitude ascriptions (such as 12 above) whose embedded sentences contain complex predicates that don’t pick out properties to be straightforwardly true or false in virtue of allowing such embedded sentences to express propositions.

In conclusion, I have tried to show that the view of propositions and propositional structure presented here has a variety of highly desirable features. On this account it is virtually undeniable that propositions exist, we can see how they represent the world, and the account immediately yields an account of the propositional contribution of complex predicates that has a number of attractive aspects. 32 It seems to me that an account of propositions with these features is worth pursuing, despite whatever difficulties with the account the insightful reader has imagined.33

Notes

* I have benefitted greatly from discussing various issues addressed herein with Michael Jubien, Michael Liston, Paul Teller and especially David Copp.
1 For example, see Jubien [1993] and Bealer [1993].
2 The material in the next four paragraphs is drawn from King [1994].
3 See May [1985] for a defense of this claim.
4 Of course some may prefer other sv’s for these various expressions, (e.g. some may think the sv’s of names cannot merely be their bearers). Those that do can still embrace the view of propositional structure being defended here. This is my primary concern. Also, I am ignoring contextually sensitive expressions, such as indexicals. To accommodate such expressions we would need the notion of the sv of an expression in a context.
5 E.g. every is the relation that obtains between the sets (properties) A and B iff A is a subset of B (each instance of A is an instance of B). Note that variables (or some similar device) occur in propositions. See note 22.
6 See King [1994] and [1995].
Conversations with David Copp convinced me of this.

If being in mental states that have propositional contents (e.g. believing) is not a matter of in some sense having mental sentences in one’s head, it is not obvious how to assign propositions to them. However, this is not a difficulty peculiar to the present view of propositions and their structures.

See King [1995] for a discussion of the likelihood of sentences of different languages expressing the same proposition on the present view, (as mentioned in the body of the text, the view taken in that paper is slightly different from the view presently being defended; however, the considerations adduced there with regard to the present issue are not affected by this difference).

Of course, this is not to deny that there may be lexical items without sv’s (e.g. “empty” names).

See King [1994]. As mentioned, the view defended in that paper is slightly different from the view presented here. However, this difference is irrelevant to the response given in King [1994] to the objection to the claim that prior to the existence of conscious creatures there were no propositions.

The considerations adduced in favor of the theory of propositional structure defended in King [1994] and [1995] also support the slightly different view being espoused here. In the text I am concerned to highlight additional merits of the present view.

As mentioned in note 4, one can take a different view about the sv’s of expressions and still embrace the view of propositional structure I am defending.

This cannot quite be claimed for the view defended in King [1994] and King [1995], (and is largely responsible for the change in the view). For, as mentioned in the body of the paper, on the view defended there a proposition consists of the sv’s of the lexical items occurring in the SI expressing it standing in the sentential relation of the SI, (i.e. the propositional relation just is the sentential relation). Though it can be claimed that, given plausible, minimal assumptions, the sentential relation exists and the sv’s of lexical items exist, the further claim that the proposition exists (i.e. that the sv’s of the lexical items stand in the sentential relation of the SI) is not supported by these plausible, minimal assumptions.

For simplicity, I talk here as though the relations obtaining between lexical items in the surface structures of English sentences are sentential relations, whereas it is really the relations obtaining between lexical items in SI’s that are sentential relations. I don’t believe that this slight oversimplification affects the point I am making.

This claim, and similar claims in the next paragraph, are not quite right, (though I think that analogous though much more complicated claims are right). For, as we shall see, sometimes propositions expressed by sentences containing complex predicates do not represent their constituents as being configured in a certain way in the world. The reason is that complex predicates contribute complex entities to propositions. These complex entities have constituents, which are therefore constituents of the propositions expressed by the sentences containing the complex predicates. However, in some cases these complex entities represent properties that do not have the constituents of the complex entity as constituents. In such a case, the proposition containing the complex entity does not represent the constituents of the complex entity as being configured a certain way in the world. Rather, it represents the property represented by the complex entity as being configured a certain way (relative to other entities). But since the constituents of the complex entity are constituents of the proposition, in such a case the proposition does not represent (some of) its constituents as being configured in a certain way. For example, the predicate ‘has one kilogram of mass’ contributes to propositions a complex, structured entity whose constituents are the sv’s of ‘one’, ‘kilogram’, etc. This complex represents a certain property (i.e. it gets mapped to the property by the definition of truth for propositions or a definition required for that definition): the property of having a certain mass. And propositions expressed by sentences containing the predicate ‘has one kilogram of mass’ represent this property as being configured a certain way (relative to other entities—e.g. some of these propositions represent objects instantiating this property). However, I do not think that the property in question has as a constituent (e.g.) the sv of ‘one’. But then propositions expressed by sentences containing the predicate ‘has one kilogram of mass’ have as a constituent an entity (the sv of ‘one’) that they do not represent as being configured in a certain way. I hope to pursue the issues cryptically discussed here elsewhere.

This representation of the proposition is misleading in that it suppresses the component of the propositional relation due to the semantic relations the lexical items ‘Mary’, ‘hit’ and ‘Lisa’ bear to their sv’s.
Objections to the claim that propositions have the same structures as sentences expressing them are addressed in King [1995].

Actually, Salmon [1986] does not have restricted quantifiers such as ‘every skier’ in his formalism. In any case, see clauses 27 and 28 (p. 145–46) of Salmon’s [1986] formal semantics. Clause 27 says that the proposition expressed by a quantified sentence consists of the contribution made by the quantifier and the contribution made by the predicate it attaches to, (this is only a rough statement of Salmon’s view, since he distinguishes between information value base (with respect to a context and assignment of values to variables) and information value (with respect to context, time and assignment of values to variables) and doesn’t use the term ‘proposition’). And clause 28 says that a complex predicate contributes a property to a proposition. See also p. 138 and p. 177–78 (note 4) where Salmon suggests that compound predicates and common noun phrases contribute properties to propositions (rather than complex, structured entities—in this case his remarks are not clearly restricted to compound predicates occurring in quantified sentences). See also Salmon’s [1989] similar remarks about compound predicates (p. 245).

The qualification ‘whose structure counts as part of the structure of the proposition’ is important here. For Salmon may think that the property contributed by the predicate is complex (and has internal structure). The point is that on his view this complexity and structure is internal to the property and hence does not count as part of the structure of the proposition. After all, distinct propositions may have the same structure, e.g. both have the structure <E,M>, but have as constituents properties M whose internal structures are quite different. That is, internal structures of the properties are not parts of the structures of the propositions.

It may be worth mentioning the motivation Salmon [1986] (pps. 155–57) provides for his account. In discussing the sentences

(A) For everyone x there is someone y such that x loves y.

and

(B) For everyone x there is someone y such that y loves x.

Salmon considers the view according to which ‘x loves y’ in A (‘y loves x’ in B) contributes to the proposition expressed by the sentence the ordered triple consisting of two unoccupied places and the relation of loving (<——, ———, loving>), and some device links the unoccupied places to the contributions of the quantifiers. Salmon rejects this approach apparently because it conflicts with a certain principle of compositionality (though the propositions expressed by A and B differ, the sentences differ only in that one contains ‘x loves y’ and the other contains ‘y loves x’ where these two open sentences make the same contribution to the propositions expressed by A and B—I should mention that in the absence of further considerations, I don’t consider this a compelling reason for rejecting the view).

Having rejected this approach, Salmon endorses the approach mentioned in the body of the text according to which the predicate in a quantified sentence contributes a property (or a propositional function—a function from individuals to propositions) to the proposition expressed by the sentence.

The approach being defended here differs from both Salmon’s approach and the one he rejects. On my view, the propositions expressed by A and B are:

(A') [Every* [ x person*]] [[some* [ y person*]] [x loves* y]]
(B') [Every* [ x person*]] [[some* [ y person*]] [y loves* x]]

where * is the contribution to the proposition of the expression e—e.g. every is the relation expressed by ‘every’; loves is the relation expressed by ‘loves’ etc. As mentioned in note 5, variables contribute themselves to such propositions. Thus, on the present view, ‘x loves y’ and ‘y loves x’ in A and B, respectively, make different contributions to the propositions expressed by those sentences: one contributes: x loves* y, the other: y loves* x. Hence the present view does not violate the compositionality principle that is violated by the view Salmon rejects. However, unlike Salmon’s own view, predicates in quantified sentences contribute complex, structured objects.

I should add that though for simplicity I have adopted the view that variables contribute them-
selves to propositions, one need not hold this. Perhaps variables don’t contribute themselves to propositions but rather some “proxy” entities—they could be numbers, sets, properties or whatever, so long as each variable contributes a different one. These entities would then function as variables in the definition of truth for propositions. Call the entities contributed by ‘x’ and ‘y’, $s$ and @ (respectively). Then whether these entities are the variables themselves or some proxy entities, we have the result that ‘x loves y’ and ‘y loves x’ make different contributions to propositions ($s$ loves* @ and @ loves* $s$, respectively). Thus we won’t have the problem Salmon notes with the “unoccupied position” approach.

23The reader who disagrees should choose two complex predicates that he/she thinks pick out the same property, but that have either different grammatical structures or contain words with different sv’s (or both). The point I wish to make will apply to analogues of 6a and 6b where these are the predicates in the embedded sentences.

24We assume here that ‘believes’ expresses a two-place relation between individuals and propositions.

25Salmon [1986] seems to agree that generally the contributions to propositions (information values, in his terminology) made by ‘fourteen days’ and ‘fortnight’ are different (p. 140). However, when these expressions occur as parts of complex predicates in quantified sentences, as they do in the embedded sentences of 8a and 8b, it seems likely that Salmon holds that the complex predicates contribute the same property to the propositions expressed by the embedded sentences. See (my) note 20.

26Some may think that this shows that the present individuates propositions too finely. For a response to this objection, see King [1995].

27It is not clear to me that there is a single problem that has been called ‘the paradox of analysis’. So as not to become embroiled in historical/interpretive controversies, I shall henceforth avoid this term.

28Those who take a dim view of analysis may wish to restate the differences between 11a and 11b in other terms.

29This applies only to analyses of one-place predicates, properties, concepts or whatever. Also, though this condition is arguably necessary, it is very likely not sufficient.

30The problems surrounding this predicate were brought to my attention by Michael Jubien [1989].

31I suppose one could claim that the predicate picks out some property other than I. However, in the absence of further explanation, this proposal seems quite ad hoc. There are no doubt other ways to avoid the contradiction as well (e.g. deny that every property instantiates itself or not). However, I wish to show that we can admit that I doesn’t exist and thus that the predicate doesn’t pick out any property without embarrassment, given the present view.

32Of course, one might have a theory of the propositional contributions of complex predicates that possesses the advantages discussed here without holding the theory of propositions and propositional structure presented here. That is, one might hold that predicates with different syntactic structures or containing lexical items with distinct sv’s (or both) make different contributions to propositions and deny that propositional relations are the composition of sentential relations and the semantic relations lexical items bear to their sv’s. My point in the present work is that the theory of complex predicates that falls out of the independently plausible theory of propositions discussed here has a number of attractive features.

33King [1995] provides responses to various objections to the theory. Though the theory defended there is slightly different from the theory presented here, the objections considered and the responses to them are common to both theories, (with the exception of objection 3—the argument that constitutes objection 3 is unsound for the reason given in that paper; however, the present view explicitly embraces the conclusion of the argument constituting the objection).

References


