

On *needing* Propositions and *looking for* Properties

Florian Schwarz
University of Massachusetts at Amherst

1. Introduction

Intensional transitive verbs (ITVs) are verbs that take, on the face of it, a nominal object argument that can receive an intensional interpretation. Classic examples are the verbs *need* and *look for*, as illustrated in (1):

- (1) a. John is looking for a semanticist.
b. Bill needs a beer.

These display the hallmark properties of intensional contexts, namely failure of extensional substitution and lack of existential import: replacing the object in (1a) with an extensionally equivalent expression alters the truth conditions of the sentence - even if the sets of semanticists and syntacticians are identical, looking for one is different from looking for the other. Lack of existential import is witnessed by the fact that the truth of (1b) does not imply that there is a beer (in the relevant context).

ITV's have been of great interest for linguistic semantics right from the beginning. Following the discussion in Quine (1960) (which was primarily concerned with philosophical issues related to intensionality, and not directly with linguistic matters), they have played an important role in a number of arguments concerning basic features of semantic theory: in the tradition of generative semantics, they were used to argue for lexical decomposition (Dowty 1979), Montague and researchers working in his framework used them to argue that we need a fully intensional semantics, including intensional quantifiers (Montague 1974, Partee 1974), and, more recently, they have been argued to be a case of verbs taking property level objects (Van Geenhoven and McNally 2005, Zimmermann 1993).

The central question in the analysis of ITVs is how the verb combines with its object argument. This has to take place in some way different from the way it does in the case of regular transitive verbs, since the objects of ITVs can be interpreted intensionally. There are three proposals for accounting for the intensional nature of the object position of ITVs: the intensional quantifier analysis (Moltmann 1997, Montague 1974), the propositional analysis (Larson et al. 1997, McCawley

Thanks to Barbara Partee, Chris Potts, John Kingston, Kyle Johnson, Angelika Kratzer, Jan Anderssen, Ilaria Frana, Keir Moulton, Rajesh Bhatt, Amy Rose Deal, Youri Zabbal, Shai Cohen, Lanko Marusic, Irene Heim, Friederike Moltmann, Ivano Caponigro, Satoshi Tomioka, Zoltan Szabo, Phillipe Schlenker, and the participants of third year seminar and semantics reading group at UMass as well as the audiences at SALT 16 and the Milan Meeting 2006 for comments and discussion. This material is based upon work supported by the National Science Foundation under Grant No. BCS-0418311 to Barbara H. Partee and Vladimir Borshev.

1974), and the property analysis (Van Geenhoven and McNally 2005, Zimmermann 1993).

The propositional analysis crucially builds on the intuitive insight that sentences containing ITVs can be given a propositional paraphrase that is semantically equivalent. The sentences in (1), for example, can be paraphrased as follows:

- (2) a. John is looking for a semanticist.
b. \approx John is trying to find a semanticist.
- (3) a. Bill needs a beer.
b. \approx Bill needs to have a beer.

In its simplest form, the propositional analysis proceeds from this observation to claiming that the (a)-sentences with the ITVs *look for* and *need* are not only semantically equivalent to their propositional paraphrases in (b), but in fact are structurally identical. Underlyingly, the story goes, the complement of the verb in the (a)-sentences is exactly the same as in the (b)-sentences, even though we only see or hear the nominal in the (a)-sentences. This analysis allows for a unified account of ITV and clausal complement versions of verbs like *need*, both of which now take a propositional complement. This in turn fits in with the highly restrictive sententialist hypothesis that intensionality only arises in propositional contexts (Larson 2002). The type of ITVs within this account simply is $\langle st, \langle e, st \rangle \rangle$.

The intensional quantifier analysis, first proposed by Montague, is an approach that is in certain ways more general, as it does not tie intensionality to propositional paraphrases (Montague argued this to be necessary for verbs like *resemble*). Instead, it analyzes ITV's as relations between individuals and intensional generalized quantifiers, assigning them the type : $\langle \langle \langle s, et \rangle, st \rangle, \langle e, st \rangle \rangle$

The property analysis is motivated by the observation that the range of nominals that can have an intensional reading in the object position of ITVs is restricted to the ones that can have a property denotation in a standard type shifting system (Partee 1986). ITVs thus are assumed to denote relations between individuals and properties, yielding the type $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$.

In this paper, I am concerned with two main points: first, I will argue that we have to distinguish (at least) two classes of ITVs, namely the *need*-class and the *look for*-class, which exhibit systematic differences in their behavior that require different analyses. In particular, I argue that while the property analysis is well-suited to account for the behavior of *look for*, a propositional analysis is required for *need*. In the second part of the paper, I discuss the details of how the proposition that *need* takes as a complement is introduced into the structure. I propose that this can be done by a small clause with a null verb *HAVE* (which is not a full concealed infinitival clause, as proposed by Larson et al. 1997) or by existential closure over the individual argument of a property denoting noun phrase in cases where the relation is contextually supplied.

2. Two Types of ITV's

In this section, I will discuss in detail the differences in the behavior of the two types of ITVs considered here, which are exemplified by *need* and *look for*. All the differences can be broadly characterized as differences in scope involving different types of expressions, namely adverbial modifiers, quantifiers, and negation. First, I turn to adverbial modifiers.

2.1. Difference 1: Adverbial Modifiers

It has been noted early on in the literature that temporal adverbials can modify the implicitly understood predicate in the complement of ITVs like *need* and *want*. McCawley (1974) provided the following examples to make this point:

- (4) a. Bill wants your apartment until June.
- b. A week ago, Bill wanted your car yesterday.

On the most natural reading (that John's desire is to have the apartment until June) the adverbial *until June* in (4a) modifies the implicit predicate *HAVE* in the complement of *want*, rather than the matrix verb *want* itself. In (4b), the point is made even more clearly, as there are two incompatible temporal modifiers in the matrix clause and the implicit embedded clause. While this yields a fully coherent reading with *want* or *need*, such a setup of course leads to utter nonsense with regular transitive verbs (say *drive*). To construct more or less minimal pairs illustrating the relevant differences between *need* and *look for*, I will employ variations of the sentence in (5). Imagine a context where Matt organizes the book tables at a conference and has to make sure that he has plenty of change available in time for the conference:

- (5) Matt needed some change before the conference.
- a. There was a time before the conference at which Matt needed some change.
- b. Matt's need is to have some change before the conference.

As indicated in (5a,b), the sentence is ambiguous between a reading on which the *before*-clause modifies the matrix clause and a reading on which it modifies the implicit complement clause (the reading suggested by the context). Such an ambiguity is absent with *look for*, as was first noted by Partee (1974). This is illustrated in (6), where *need* has simply been replaced with *look for*:

- (6) Matt was looking for some change before the conference.
- a. There was a time before the conference at which Matt was looking for some change.
- b. # Matt's search-goal was to find some change before the conference.

The sentence in (6) can only mean that there was a point in time that happened to be located before the conference and, at that point, Matt was looking for some change.

It is not part of the goal of his attempts to have the change available before the conference. He may well want to find it as soon as possible, but his search will be a success even if he finds the change after the conference started, and there simply is no reading such as the one indicated in (b) on which this would not be so.

Larson et al. (1997) attempt to account for the lack of the (b)-reading above in pragmatic terms by pointing out that one cannot look for something at time t_1 with the goal of finding it at a later time t_2 . However, Larson et al. are also committed to *look for* being (almost) equivalent to *try to find*, and with the latter, it is no problem at all to include a temporal modification as a part of the goal:

- (7) a. John tried to find a camera in 30 seconds.
b. #John looked for a camera in 30 seconds.
- (8) a. I am trying to find a bar that shows soccer games before the world cup final.
b. # I am looking for a bar that shows soccer games before the world cup final.

While it makes perfect sense to try to accomplish a task such as finding a camera in 30 seconds, it is unclear what it means to look for a camera in 30 seconds, if this is a possible phrase at all. Likewise, it is very plausible that I have a goal of finding a place to watch the world cup final before said final takes place, but it is impossible to express this with the sentence in (8b) with *look for*.

In conclusion, there is a clear contrast between *need* and *look for* with respect to the possibility of temporal modification within the complement of these verbs.¹

Next, I turn to a new type of complement-modifier evidence involving the expressions *too* and *again*. This evidence is helpful for two reasons: first, it provides a straightforward test that should help to clarify how exactly *need* and *look for* differ from one another. If there is a structural difference between them, then we expect to find the same contrast with these modifiers as we did with temporal adverbials. Secondly, they provide an even stronger case against a pragmatic account of the differences between the two verbs, since there is no reason why they should differ with respect to the possibility of having *too* or *again* modify their complement, as far as pragmatic plausibility is concerned.

To test whether *too* can modify the implicit embedded clause that is the complement of *need*, we have to put some work into setting up the right kind of scenario. Very roughly, *too* associates with a preceding focus and introduces a presupposition that some other thing (which has to be more or less explicitly introduced in the context) has the property denoted by the background of the sentence. In order to exclude the reading where *too* attaches to the matrix verb *need*, we have to give a context where the presupposition of *too* is satisfied on the reading where it attaches to the lower clause but not satisfied on the matrix clause attachment reading. This is exactly what the following little story serves to do:

¹See Forbes (2006) for similar arguments.

- (9) While rummaging around the attic, Maria found her dad's old camera, which she thought had been long lost. When she told him, he asked her to take pictures with it at the party he was about to throw. Maria really didn't need it, since she had a nice new digital camera, but she didn't want to be impolite, so she promised him that she would take some pictures with his camera.

In this scenario, it is explicitly stated that Maria does not need her dad's camera (and nothing else is introduced that she needs). It is also clear that she wasn't looking for the camera, but simply stumbled upon it. Now this story can be continued felicitously with the sentence in (10) with *need*, but not with the sentence in (11) with *look for*:

- (10) Now she needs [a roll of FILM for the camera]_F too before the party starts.
- a. low attachment presupposition (satisfied in context):
She has something else apart from the roll of film.
 - b. high attachment presupposition (NOT satisfied in context):
She needed something else apart from the roll of film.
- (11) #Now she is looking for [a roll of FILM for the camera]_F too before the party starts.
- a. hypothetical low attachment presupposition (satisfied in context):
She found something else.
 - b. high attachment presupposition (NOT satisfied in context):
She had looked for something else.

How can we understand this difference? Intuitively, (10) has two possible readings concerning the presupposition of *too*, as indicated in (a) and (b). The high attachment reading in (b) is not felicitous, since this is the presupposition whose satisfaction we explicitly excluded with the scenario. So it has to be the low reading in (a), on which it is presupposed that Maria has something else, which renders this sentence felicitous. The situation is different with *look for* in (11). Again, the high attachment reading of the presupposition of *too* in (b), on which Maria had looked for something else, is not satisfied in the context. If *look for* worked like *need* (i.e. involving an implicit clausal complement resembling *try to find*), there should also be a low reading, on which *too* presupposes that Maria found something else. Such a presupposition would indeed be satisfied in the context, as Maria had found her dad's camera. However, the sentence in (11) is not a felicitous continuation of the story above, and hence we can conclude that the low reading of *too* is unavailable for *look for*.

A parallel point can be made with *again*, which has been used to identify different possible attachment sites for a number of constructions in the literature (von Stechow 1996, Beck and Johnson 2004). The following scenario again provides a setup where the presupposition of the high attachment readings is not satisfied while that of the low attachment readings is. And again, we find a contrast in the felicity between *need* and *look for*:

- (12) Several years ago, John inherited everything his grandfather owned, including a few surprise items. For example, he found a brand new Mercedes in the garage. As he was living in Manhattan at the time, he really didn't need a car at all. He kept the Mercedes in a garage for a while, and then decided to sell it - he never regretted it, since he just didn't need it. Last month, John accepted a new job in upstate New York.
- (13) He definitely needs a car again while he lives up there.
- a. low attachment presupposition (satisfied in context):
John had a car before.
 - b. high attachment presupposition (NOT satisfied in context):
John needed a car before.
- (14) #Now he is looking for a car again before the move.
- a. hypothetical low attachment presupposition (satisfied in context):
John had found a car before.
 - b. high attachment presupposition (NOT satisfied in context):
John had looked for a car before.

In summary, these examples employing *too* and *again* (in addition to the ones using temporal modifiers) provide strong evidence that *need* and *look for* differ systematically with respect to the possibility of modifying their complements.

2.2. Difference 2: Quantifier Scope

In this section I show that *look for* and *need* also differ with respect to the quantifier scope possibilities of their objects. As I noted above, it has been claimed in the literature that only nominals which can have a property denotation in the type shifting system of Partee (1986) can have a low scope reading (Zimmermann 1993). In the following, I show that this only holds for *look for* and not for *need*. For present purposes, the quantifier *most* is well suited, as it arguably does not have a property denotation. At the same time, it allows us to distinguish the different scopal readings, unlike a universal quantifier, for which scope with respect to *need* cannot be established directly (assuming that *need* involves universal quantification over possible worlds).

Take again the context from above, where Matt is running a book table and has to have enough change available. Now consider the sentence in (15):

- (15) Matt needs most of the small bills that were in the cash-box.
- a. for most bills x: Matt needs x
 - b. in all worlds where Matt's needs are met, he has most of the bills

This sentence has two readings, as indicated in (a) and (b). The plausible reading is the one in (b), where *most* takes scope below *need*. On this reading, what matters to Matt is that he ends up with a majority of the bills, without caring about the

particular identity of the bills. The reading in (a) (with *most* taking scope above *need*) is also available, but implausible. With things like bills we typically do not care about the identity of particular bills but about the amount. Since the sentence in (15) is plausible, we can conclude that it does indeed have the reading in (b) and hence that *most* can take scope below *need*.

Turning to *look for*, we again find a contrast. Consider (16), where *need* has been replaced with *look for*:

- (16) # Matt is looking for most of the small bills that were in the cash-box.
 a. most bills *x* are s.t. Matt is looking for *x*
 b. * in all worlds where Matt's search is successful, he has found most of the bills

In contrast to (15), this sentence does not have a plausible reading along the lines of the paraphrase in (b). It only has the implausible reading paraphrased in (a), on which the search is directed towards particular individual bills which together make up the majority of the bills.² The absence of the plausible reading in (b) clearly shows that it is impossible for *most* to take scope below *look for*. Hence we have established another clear difference between *need* and *look for*.

2.3. Difference 3: Scope of Negation

The third difference concerns the scope of negation.³ It has been noted in the literature already that there is a clear contrast between verbs like *need* and *look for* in this respect (Van Geenhoven and McNally 2005). This difference comes as no surprise after the preceding sections, as it patterns with the observations made there: low scope is possible with *need*, but not with *look for*, for example in the following sentences:

- (17) John is looking for no assistants.
 (18) John needs no assistants.

The sentence in (17) clearly cannot be understood in such a way that the goal of John's search is to find no assistants. It can only mean that there is no assistant that John is looking for. But while the preferred reading with *need* is also one where negation takes high scope, this is by no means necessary. With proper context (and perhaps a particular intonation), the low scope reading is also available, as can be seen in the following example (taken from unpublished lecture notes by Kai von Fintel and Irene Heim):

²As Barbara Partee noted (p.c.), this reading becomes plausible if we switch to a scenario where the police are looking for bank notes with certain serial numbers that originate from a bank robbery. It might then turn out that they were looking for most of the bills in the cashbox.

³Depending on your favorite analysis of *no DP*, you might put this in either one of the previous categories. However, since nothing directly hinges upon this decision, I discuss these cases separately here.

- (19) I'm trying to finish my paper this weekend, so I need no visitors!

Furthermore, the preference is reversed for *want*: If you want no visitors, it is quite clear that all your desire worlds are worlds in which there are no visitors.

One interesting point in connection with this concerns subtle differences between overt and covert clausal complements with *need*. It has been claimed in the literature that the scope possibilities with negation differ between the two cases (narrow scope only for the overt cases and wide scope only for the ITV cases), which in turn has been brought forward as a counter argument against a clausal analysis (Zimmermann 1993, Moltmann 1997). However, not only are both readings at least in principle possible with the covert complement, as illustrated above, but they are also both possible with overt clausal complements:

- (20) The President really needs to have no military training in order to serve in his role as Commander in Chief. [Google]
 (21) In theory modern Linux distributions make it so the user needs to have no idea where their programs are physically installed. [Google]

Obviously, the author of (20) is not trying to express that only people inexperienced in military matters can serve as Commander in Chief (the low scope reading), but rather that it is not necessary for the President to have military experience. Similarly, (21) allows for educated users that do indeed know where the programs are physically installed.

In summary, there are two points to be taken away from this section. First, as is well known, *look for* and *need* differ with respect to the scope possibilities for *no DP*, and secondly, the alleged differences in the scope possibilities between covert and overt complements with *need* are at most a matter of preference and do not constitute a principled distinction.

2.4. Different Behavior - Different Analyses

In this section, I have established a number of systematic differences in the behavior of various modifying and scope taking expressions with respect to the complements of *need* and *look for*. I suggest that we account for these differences in a very straightforward way, namely by assuming different analyses for the two types of verbs.

Need takes a propositional complement, which can be modified by temporal adverbs and expressions such as *too* and *again*. It is furthermore possible for real quantifiers and negation to take scope within this embedded proposition, and therefore below *need*. Such an analysis has the further advantage that the denotation of *need* remains the same even when we consider complements that look, at least on the face of it, rather different from one another, namely overt clauses versus nominals. *Need* might still be somewhat flexible with respect to the syntactic type of its complement, but semantically it always combines with a proposition.

Look for, on the other hand, takes a property complement. This property denoting complement is not of the right kind to be modified by temporal adverbials.

Furthermore, real quantifiers cannot take scope below *look for*, because they cannot be shifted to a property. For this type of verbs, the property analysis proposed by Zimmermann (1993) (also defended by VanGeenhoven and McNally 2005) works well, and I have little to add to the details of that analysis here. One remaining issue of interest for future research concerns the question whether *look* and *for* are combined compositionally and if so, what exactly each part contributes to the meaning of the entire expression. Partee (1974) already observed that the class of intensional verbs with *for* seems to be rather open (examples include *rummage around for*, *feel around for* etc.). This suggests a productive process in which the preposition *for* may play a crucial role for the intensional nature of the object position.

Another important question in view of these two distinct analyses is what verbs belong into which class. In the simplest of all worlds, one might guess that all verbs that can take an overt clausal complement generally take propositional arguments, whereas those that don't fall into the *look for*-class and take a property argument. However, things are most likely not that simple, as there seem to be cases of verbs that can take both a propositional and a property complement, for example *conceive* (Szabo 2005).⁴ Future investigation of this issue should contribute important insights into the syntax-semantics interface, as there seem to be interesting limitations on type-shifting (or some other mechanism that relates denotations of an expression that have distinct types but are more or less equivalent in meaning) that possibly are connected to or interact with the possible range of syntactic complements that these verbs can take. While these issues are far beyond the scope of the current paper, the tests employed in this section should be of great help in approaching them.

Having established the first main point of distinct analyses for *need* and *look for*, I now turn to the second issue, namely the question of how the proposition that *need* combines with is introduced into the structure.

3. In Need of a Proposition

3.1. Where Does the Proposition Come From? - Two Simple (But Wrong) Solutions

Assuming that *need* takes a propositional complement, we have to figure out how that proposition is introduced. To begin with, I consider two simple solutions and a number of problems that they face. The first solution is, in essence, the propositional analysis as known from the literature (McCawley 1974, Larson et al. 1997), and the second is a simple semantic solution. Let us turn to the former first.

A solution along the lines of McCawley and Larson rests on the assumption that the overt clausal complement version of *need* and the ITV version are structurally identical. So according to this analysis, the structure of (22a) is the same as that of (22b) and looks as in (23) (Larson et al. 1997). The only difference lies, if

⁴Szabo does not advocate a property analysis of the non-propositional cases there, but it seems likely that such an analysis is on the right track.

you will, in the pronunciation, because the ITV case involves a number of unpronounced elements.

- (22) a. John needed a car.
 b. John needed for himself to have a car.
- (23) John needed [_{CP} FOR PRO TO [_{VP} HAVE a car]]

This type of solution puts all the burden on the syntax, which has to include phonologically null elements and hidden structure. Semantically, the overt complement clause case and the ITV case work in exactly the same way. In general, this account predicts the overt and covert clausal complement cases to behave the same, so any parallels between the two cannot only be accounted for but can also be taken to support this approach. Any differences between the two, on the other hand, pose a challenge.

An alternative possibility is what one might call a semantic solution.⁵ The idea is to use the familiar semantic tool of existential closure to derive the right type for the complement of *need* from the denotation of the noun phrase. As was already mentioned above, one possible denotation for certain noun phrases is that of a property (Partee 1986), i.e. one of type $\langle e, st \rangle$. We are working under the assumption that *need* takes a proposition as a complement, so, loosely speaking, we have to get rid of the individual argument (type e) to get something of type $\langle st \rangle$. This can be done simply by applying existential closure to the individual argument. If we take propositions to be sets of situations⁶, this will leave us with a set of situations that contain individuals in the extension of the noun in question. The steps in the derivation are illustrated in (24):

- (24) John needed [\exists a car].
- a. $\llbracket a \text{ car} \rrbracket = \lambda x. \lambda s. car(x)(s)$
 b. $\llbracket \exists a \text{ car} \rrbracket = \lambda s. \exists x. car(x)(s)$
 c. $\llbracket John [need [\exists a \text{ car}]] \rrbracket = \lambda s. \forall s' NEED(s')(j)(s) \rightarrow \exists x. car(x)(s')$
 ‘In all situations s' in which John’s needs in s are satisfied, there is a car.’

Once existential closure has taken place, the verb can combine with the resulting proposition and yield a standard meaning as formulated in a possible worlds semantics in (c). Note that in this solution, no particular relation has to hold between John and the car - there simply has to be a situation that contains both. Whatever concrete relation we understand there to be in interpreting such sentences then must come from additional pragmatic inferencing, since it is not encoded in the semantics. We will return to this point below.

One point to note here is that this approach can easily account for the cases of temporal modification discussed earlier. If we take the relevant modifiers to denote sets of situations (that have certain properties concerning their temporal

⁵Thanks to Angelika Kratzer for discussing the details and implications of this type of approach.

⁶A convenient and plausible assumption for this approach, although maybe not a necessary one.

location), then we can combine the result of existential closure over the individual argument of property denoting noun phrases with these modifiers by means of predicate modification or set intersection.

Unfortunately, both of the simple solutions sketched here face some real problems, which I will turn to in the next two subsections.

3.2. Problems for the Semantic Solution

The semantic solution I just sketched lets existential closure do all the crucial work and does not assume any complex structure within the complement. The first problem that this approach faces is already familiar from the first part of the paper. We have seen in section 2 that expressions like *too* and *again* can modify the complement of *need*. Turning to the analysis of these cases in a little more detail and assuming the semantics for *too* from Heim (1992) in (25), we can capture the situation as follows:

- (25) $\Phi [\alpha]_F \text{ too}_i$ presupposes $x_i \neq \alpha$ & $\Phi(x_i)$
- (26) Maria needs [a roll of film]_F too.
 - a. Maria needs something else apart from a roll of film.
 - b. Maria has something else apart from a roll of film.

There is an ambiguity concerning the presupposition that *too* introduces, as indicated by the rough paraphrases in (26a,b). The question is how the (b)-reading arises. *Too* combines with an entire clause, and the presence of the (b)-reading strongly indicates that *need* takes a clausal complement.

To strengthen this point, the following contrast shows very clearly that *too* indeed attaches to the lower clause, and not the matrix clause:

- (27) John didn't need the computer you gave him for Christmas and (now) he certainly doesn't need a laptop too.
- (28) John didn't need the computer you gave him for Christmas and he certainly doesn't need a laptop either.

If we use the negated form in the matrix clause, as in (28), then only *either* can be attached to that clause. Since *too* also can be used felicitously in this sentence, as in (27), it really must be attaching to an embedded clause.

Now that we have looked at the *too*-cases in more detail, let us turn to the predictions of the semantic solution. After existential closure is applied to the object of *need*, *too* could introduce the following presuppositions:

- (29) a. Maria [needs $[\exists$ a roll of film]_F] too.
 - b. There is something else that Maria needs.
- (30) a. Maria needs $[\exists$ [a roll of film]_F] too.
 - b. There is something else apart from a roll of film.

Although we do get a potential ambiguity (assuming that *too* can attach to the object noun phrase after existential closure), we do not get the right readings. The reading in (30) is far too weak: merely requiring something else to exist is trivial and does not correspond to our intuitive understanding of the presupposition reading we are trying to capture.

To get the low-attachment presupposition that we detected, there needs to be some part of the tree that denotes the proposition that Maria has a roll of film:⁷

- (31) a. Maria needs [[MARIA HAVE a roll of film]_F] too.
b. There is something else that Maria HAS.

A further problem for the semantic solution, which we have also already discussed, concerns the possibility of low scope readings of quantifiers like *most*, such as the one paraphrased in (32b):

- (32) a. Matt needs most of the bills.
b. in all worlds where his needs are met, he has most of the bills

This constitutes a problem for the semantic solution, because the existential closure trick only works for nominals that have a property type, which quantifiers like *most* do not.⁸

3.3. Problems for the Covert Infinitival Complement Account

Turning to the syntactic solution, which assumes a covert infinitival complement, there also are a number of problems. As mentioned above, any differences between the covert and the overt complement cases constitute a problem for this account.

Such differences indeed exist, and a few of them are illustrated by the following examples:

- (33) a. I need to finally have a laptop.
b. *I need finally a laptop (that works reliably every time I use it).
(34) a. #/* To have a laptop before the presentation is just what I need.
b. A laptop before the presentation is just what I need.
(35) a. */#It was to have a laptop before the presentation that I needed.
b. It was a laptop before the presentation that I needed.

If the structures of (33a) and (33b) were the same, it would be unclear why an adverb like *finally* cannot appear in the same position in the latter as in the former, since the same attachment site would be available. The contrasts in (34) and (35) furthermore show that while the covert cases can appear in pseudo-clefts and clefts, the overt infinitival complements cannot.

⁷A similar argument can be made for *again*.

⁸If one was to suggest here that *most DP* indeed can have a property type denotation one is at a loss about the contrast with *look for* found above.

Another piece of evidence that the overt and the covert complement cases behave differently comes from German *brauchen* ‘need’. *Brauchen* can either take an infinitival clause (with *zu* ‘to’) or a nominal complement. Interestingly, the two come with different requirements. When it combines with an infinitival clause, it behaves like a negative polarity item, i.e. it has to be licensed, for example by negation. But when it combines with a nominal, no such restrictions exist:

- (36) a. Hans braucht keine Angst zu haben.

Hans needs no fear to have

‘Hans doesn’t need to be afraid.’

- b. *Hans braucht Angst zu haben.

Hans needs fear to have

- (37) Hans braucht (kein) Geld.

Hans needs (no) money

‘Hans needs (no) money.’

Something like the negative quantifier (or negative indefinite) *keine* ‘no’ has to be present in order for the sentence in (36) to be grammatical, as witnessed by the contrast in (a) and (b). With *braucht DP*, on the other hand, no such requirement holds, as shown by the optionality of *keine* in (37).⁹ If the overt and covert complement forms were completely identical with respect to their structure and only differed in what parts of the complement are pronounced, this contrast would be unexpected.

A further point concerns the meaning of HAVE. If the pronounced form *have* and the unpronounced form HAVE were exactly the same, we would expect the latter to be able to participate in the same range of idioms as the former (a few cases where this is possible were indeed used by McCawley (1974) as support for his HAVE-deletion analysis). However, it has been noted (by Wechsler 2005, among others) that this is not the case, as can be seen in (38) and (39):

- (38) I need a shower (\neq have a shower)

- (39) ??I want a blast (\neq I want to have a blast)

(Wechsler 2005)

⁹There is a very interesting contrast in this respect between the null verb HAVE (which I assume to be present in the complement of *need* below) and the null verb GO (van Riemsdijk 2002). GO can appear with directional prepositions in the complement of *wollen* ‘want’ (which also takes overt infinitival complements, but without *zu* ‘to’) and a number of other verbs, but in the complement of *need*, it has to be licensed by something like negation, i.e. it patterns with the overt infinitival complements:

- (1) a. Hans will (nicht) nach Hamburg.

Hans wants (not) to Hamburg GO

‘Hans wants to go to Hamburg.’

- b. Hans braucht *(nicht) nach Hamburg.

Hans needs (not) to Hamburg GO

Prima facie, one would expect the two to behave the same here, but apparently, the case of GO indeed is one with a full covert infinitival complement (presumably with a covert *zu*).

At least in American English, one does not have a shower, nonetheless one can need a shower. On the other hand, it is unclear what it would mean to want a blast in a non-literal sense, which contrasts with *having a blast*. Furthermore, there are clear cases where the relation between the matrix subject and the object in the complement of *need* can be supplied by the context. Take (40), which might be said by a coach about his athlete John, who needs to have an experience of success:

(40) John needs a marathon (#have a marathon)

This cannot be paraphrased with *have*, and is understood as John needing to run or participate in a marathon. Interestingly, when two ITVs are conjoined, the relation has to be the same one for both cases. To see this, consider the verb *choose*, which can function as an ITV, as shown in (41):

(41) For our journalism class, we had to interview a school official.
I chose the dean.

As in the last example with *need*, the relation in the complement of *choose* comes from the context (here: interview). That *choose* functions as an ITV here can be seen from the fact that I don't need to know (or care) who the dean is (and if the dean also is the soccer coach, it doesn't follow that I chose the soccer coach), and that it does not follow from (41) that there is a dean. Now, turning to an example where *need* and *choose* are conjoined, we can see that the relation has to be the same for both complements:

(42) In our arts and crafts class, we were supposed to build something useful.
a. #John needed and chose a birdhouse
b. ≠John needed to have and chose to build a birdhouse.

The sentence in (42a) clearly cannot mean the same as the one in (42b). This is again unexpected if there was the option of having two distinct infinitival complement clauses, one for each ITV.

From these various contrasts, I conclude that the complement of *need* (in *need DP*) is not a complete covert infinitival clause with an elided *have*.

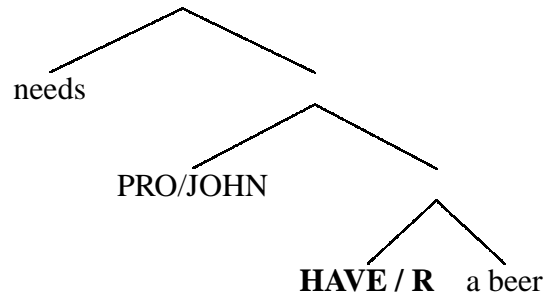
3.4. First Shot at a New Analysis: A Small Clause with Contextual *R*

Putting together the conclusions from the evidence presented in the preceding sections, we can summarize the core properties that we want the complement of *need* to have as follows. We need

- a proposition,
- a relation between the matrix subject and the object DP (either a null verb HAVE or a contextually supplied relation) that is in the structure,
- something smaller than a full infinitival clause.

Putting these pieces together, we arrive at the following structure for *need* and its complement (see Harley (2004) for a similar proposal with P_{HAVE}):¹⁰

(43) John needs a beer



On this analysis, *need* takes a small clause complement which involves either a null verb HAVE or a relational variable R that can be filled in by the context. This structure has all three properties listed above. However, things are not quite yet in place.

3.5. A Final Twist

There have been two main pieces to the arguments that have led us to the structure proposed in the last subsection. One main point has been that expressions like *too* and *again* (as well as temporal adverbs) can adjoin to the embedded clause that is the complement of *need*. A second important point was that the relation in this complement clause can be supplied by the context. In the analysis I just presented, these two pieces are assumed to go together.

But do they really go together? There is good reason to believe that they don't. The cases that involve HAVE differ in crucial ways from the cases with a contextually supplied relation R. In the latter case, only temporal modifiers like *before* seem to be able to attach to the embedded clause:

(44) He needs a marathon before the Olympics.

Interestingly, durational adverbs and *too* seem not to be able to modify the embedded clause with R:

(45) John needed a beer in thirty seconds.

CANNOT mean: 'John needed to [drink a beer in thirty seconds]'
(inspired by Wechsler 2005)

¹⁰I'm leaving open the question of how exactly the matrix subject is represented in the embedded clause, because I am uncertain about what mechanism would be most attractive syntactically. Therefore, I simply put *PRO/JOHN* in the structure. What is central for present purposes is that the modification facts require the subject to be represented in the embedded clause in some form or other.

- (46) Hans brauchte schnell ein Bier
 Hans needed quickly a beer
 CANNOT mean: ‘He needed to [drink a beer quickly]’

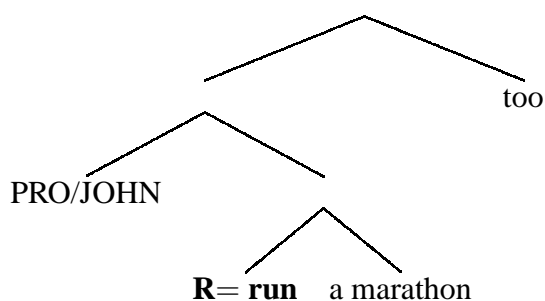
As Wechsler (2005) observed, the range of temporal adverbs that can modify the complement of verbs like *need* with a contextually inferred relation is quite limited. In (45), *in thirty seconds* can only specify the time within which John needs to have the beer. It cannot specify that in John’s need worlds, the drinking takes place within thirty seconds. Similarly, *schnell* ‘quickly’ in the German example in (46) can only express that Hans needs to have the beer soon, not that the drinking needs to happen quickly.

The same situation holds with respect to *too*. The sentence in (47), built on the model of (27) above (which helped to make the crucial point that something like HAVE is present in the structure), involves a contextually supplied relation rather than HAVE and, somewhat surprisingly, is infelicitous:

- (47) #He didn’t need the marathon you made him run, and now he certainly doesn’t need an ultramarathon too.

Just as in (27) above, the presupposition of *too* would be satisfied on a low attachment reading. The fact that the presupposition of *too* is not satisfied here therefore tells us that the low attachment reading is unavailable. This is completely unexpected on the analysis currently under consideration. If R was in the structure, we would expect low attachment readings with R, just as with HAVE:

- (48) John needed a marathon too



What shall we conclude from this? I suggest that a final twist is in order. The main arguments for the presence of extra structure in the complement of *need* seem to only work for the cases where we are dealing with a covert HAVE. In the cases where we have a contextually supplied relation R, these arguments do not go through. Hence we have no grounds to posit this extra structure in the latter cases. What we need then, are two different structures for these two cases. While we can maintain that there is a clausal complement with HAVE, there apparently isn’t one with R. For this case, we can then revert to the semantic solution discussed above, with existential closure over the individual argument of the property denotation of the object noun phrase. Thus, the two structures are as follows:

(49) John [needs [PRO/JOHN [HAVE [a laptop]]]]

(50) John [needs [\exists [a marathon]]]

On a more general level, this analysis is more satisfying because it lets us avoid representing the contextual variable in the structure. Something like the null verb HAVE, on the other hand, has been argued to be needed for other constructions as well, for example for double object constructions (Beck and Johnson 2004), and fits in well with the more general picture of null verbs developed in recent literature (van Riemsdijk 2002).

4. Conclusion

The first part of this paper was devoted to carving out a number of systematic differences between *look for* and *need* concerning adverbial modification and the scope of quantifiers and negation. In general, low attachment or low scope was shown to be possible with *need*, but not with *look for*. I argued that the most straightforward account delivering these differences is one that assigns distinct analyses to the two types of ITVs. *Look for* takes a property as a complement, as proposed by Zimmermann (1993). *Need*, on the other hand, takes a clausal propositional complement, which allows for modification and low attachment of the relevant expressions.

The second part of the paper dealt with the question of how the proposition that *need* takes as a complement is introduced into the structure. I concluded that this can be done in two ways: either by a small clausal complement with a null verb HAVE or by existential closure over the property denotation of the object noun phrase, in which case the relation between the matrix subject and the object is contextually inferred.

As a final point, let me point out a more general implication of the arguments from the last section. We have found that in cases where the relation in the complement of *need* is contextually inferred, there is clear empirical evidence that no contextual variable for this relation is represented in the structure. This bears on the more general issue of the representation of contextually supplied material. Jason Stanley and others have argued that all such material indeed has to be represented in the structure (Stanley 2002). The point made above provides a counterexample to this claim. If we assume R to be present in the structure of the complement of *need*, we make false predictions about the possibility of modifying this relation. Thus we have good reason to assume that R is not present in the structure. Needless to say, this issue requires further investigation, but it shows once more that a better understanding of the semantics of ITVs can teach us important lessons about the semantics of natural languages in general.

References

- Beck, Sigrid and Kyle Johnson: 2004, 'Double Objects Again', *Linguistic Inquiry* **35**, 97–123.
- Dowty, David: 1979, *Word Meaning and Montague Grammar*. Reidel, Dordrecht.
- Forbes, Graeme: 2006, *Attitude Problems*. Oxford University Press, Oxford.
- Harley, Heidi: 2004, 'Wanting, Having and Getting: A Note on Fodor & Lepore 1998', *Linguistic Inquiry* **35**, 255–267.
- Heim, Irene: 1992, 'Presupposition Projection and the Semantics of Attitude Verbs', *Journal of Semantics* **9**, 183–221.
- Larson, Richard K.: 2002, 'The Grammar of Intensionality', in *Logical Form and Language*. Clarendon Press, Oxford.
- Larson, Richard K., Marcel den Dikken, and Peter Ludlow: 1997, 'Intensional Transitive Verbs and Abstract Clausal Complementation'.
- McCawley, J.: 1974, 'On Identifying the Remains of Deceased Clauses', *Language Research* **9**, 73–85.
- Moltmann, Friederike: 1997, 'Intensional Verbs and Quantifiers', *Natural Language Semantics* **5**, 1–52.
- Montague, Richard: 1974, 'The Proper Treatment of Quantification in Ordinary English', in *Formal Philosophy: Selected Papers of Richard Montague*. Yale University Press, New Haven.
- Partee, Barbara H.: 1974, 'Opacity and Scope', in *Semantics and Philosophy*. New York University Press, New York.
- Partee, Barbara H.: 1986, 'Noun Phrase Interpretation and Type-Shifting Principles', in *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*. Foris, Dordrecht.
- Quine, W. V.: 1960, *Word and Object*, Studies in communication. Technology Press of the Massachusetts Institute of Technology, Cambridge.
- van Riemsdijk, Henk: 2002, 'The Unbearable Lightness of GOing', *The Journal of Comparative Germanic Linguistics* **5**, 143–196.
- Stanley, Jason: 2002, 'Nominal Restriction', in *Logical Form and Language*, 365–388. Oxford University Press, Oxford.
- von Stechow, A.: 1996, 'The Different Readings of Wieder "again": A Structural Account', *Journal of Semantics* **13**, 87–138.
- Szabo, Zoltan Gendler: 2005, 'Sententialism and Berkley's Master Argument', *The Philosophical Quarterly* **55**, 462–474.
- Van Geenhoven, Veerle and Louise McNally: 2005, 'On the Property Analysis of Opaque Complements', *Lingua* **115**, 885–914.
- Wechsler, Stephen: 2005, 'Wanting, Getting, and Enjoying It. Handout from Talk Presented at the University of Berkley'.
- Zimmermann, Thomas Ede: 1993, 'On the Proper Treatment of Opacity in Certain Verbs', *Natural Language Semantics* **1**, 149–179.