

Situation Pronouns Where you Need Them

A situation semantic account of transparent interpretations and contextual domain restriction

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Abstract

It is commonly argued that natural language has the expressive power of quantifying over intensional entities, such as times, worlds, or situations. A standard way of modelling this assumes that there are unpronounced but syntactically represented variables of the corresponding type. Not all that much as has been said, however, about the exact syntactic location of these variables. Furthermore, recent work has highlighted a number of problems that arise because the interpretive options for situation pronouns seem to be subject to various restrictions. This paper is primarily concerned with situation pronouns inside of determiner phrases (DPs), arguing that they are introduced as arguments of (certain) determiners. The various restrictions on their interpretation are shown to fall out from the semantic system that is developed based on that view. In the second part of the paper, the analysis is extended to account for contextual domain restriction, building on previous work in situation semantics. In addition to providing a detailed situation semantic analysis of domain restriction in terms of the situation pronouns argued for in the first part, I provide novel arguments that favor such a situational account over the standard treatment in terms of so-called *C*-variables. The paper closes with consideration of possible extensions and further issues.

1 Introduction

It is commonly argued that natural language has the expressive power of quantifying over intensional entities, such as times, worlds, or situations. A standard way of modelling this assumes that there are syntactically represented variables of the corresponding type, which happen to be unpronounced. Not all that much as has been said, however, about the exact syntactic location of such variables. This paper is primarily concerned with situation pronouns inside of determiner phrases (DPs), and argues that they are introduced as arguments of (certain) determiners. I spell out a detailed semantic system based on this point. This system is shown to provide a novel and unified perspective on two important classes of semantic phenomena: first, the ‘intensional independence’ of certain types of DPs displayed in what are commonly called ‘transparent interpretations’, as well as the various restrictions on the availability of such interpretations. Secondly, I show that situation pronouns also provide all that is needed for an account of contextual domain restriction. In addition to

spelling out a detailed situation semantic analysis of domain restriction, I provide novel arguments that favor such an account over the standard treatment in terms of C -variables.

The paper is organized as follows. In section 2, I briefly review the general motivations for representing situation pronouns syntactically. The various restrictions on their interpretation discussed in recent work (Percus, 2000; Keshet, 2008, 2010a) are laid out in detail as well. Section 3 makes the case for representing situation pronouns inside of DPs as arguments of determiners and spells out a semantic system that incorporates this. The restrictions from Percus (2000) and Keshet (2008) are shown to follow automatically in this system, unlike. In section 4 I turn to the issue of domain restriction. After reviewing some basic background, I show that all the relevant phenomena can be dealt with in the present system, and that it has distinct advantages over more standard accounts based on C -variables, e.g., with respect to the issue of the syntactic location of the variables responsible for domain restriction. Section 5 closes by taking stock and raising various open issues and possible extensions of the theory.

2 Background: Syntactically Represented Situation Pronouns

There are two main lines of argument in the literature in support of the notion of syntactically represented variables for worlds and times (or situations). One stems from general arguments about the expressive power of natural language as far as modal and temporal reference are concerned. The second concerns what I will call the intensional status of DPs, i.e., the issue of whether a nominal predicate is interpreted relative to the same world (or time or situation) as the other predicates in its clause or not. Since my focus in this paper will be on situation pronouns inside of DPs, I will only review the former very briefly, and pay closer attention to the latter. (But see section 5 for more general issues that arise based on the present proposal.)

2.1 Expressive Power Arguments

Early work in temporal and modal logic, e.g., by Kripke and Prior, as well as in formal semantics for natural language (Montague, 1974) treated times and worlds differently from individual variables. In particular, modal and temporal operators were seen as merely shifting the appropriate evaluation index on the interpretation function, while individuals could be quantified over in the object language. However, as was first shown for tense (Kamp, 1971; Vlach, 1973; Benthem, 1977), and later generalized to worlds (Cresswell, 1990) and situations (Kratzer, 2007), there are examples which show that natural language has the expressive power of quantification over worlds and times (or situations) in the object language:

- (1) There will be times such that all persons now alive will be happy at the first or miserable at the second.
(Cresswell, 1990, p. 20)
- (2) If it might have been that everyone actually rich was poor then the economy would have been in bad shape.
(Cresswell, 1990, p. 38)

- (3) If, whenever it snowed, it had snowed much more than it actually did, the town plow would have removed the snow for us.

(Kratzer, 2007, ex. (23))

Roughly speaking, what these examples show is that even in the context of an intensional operator, we are able to make reference to times, worlds, or situations introduced at the level of a higher clause. For example, in (3), “we have to be able to consider for each actual snowfall s a set of counterfactual alternatives and compare the amount of snow in each of them to the actual amount of snow in s . This means that we have to be able to ‘go back’ to the actual snowfall situations after considering corresponding counterfactual situations.” (Kratzer, 2007). Since the effect can be iterated at will, its analysis requires the expressive power equivalent to that of quantifying over the relevant entities in the object language. Technically, this can be implemented either by representing variables of the right kind in the syntax and allowing intensional operators to bind them quantificationally, or by allowing infinite sequences of evaluation indices (Cresswell, 1990). While these well-established examples provide a general argument for the syntactic representation of world, time, or situation variables, they do not *per se* tell us where in the structure we need the relevant variables. The next sections address this issue for one one class of situation pronouns, namely those inside oef DPs, after considering what is known about their intepretive options in intensional contexts in some more detail.

2.2 The Intensional Independence of DPs

Since early on in work on intensional semantics of natural language, it has been noticed that DPs in intensional contexts can be interpreted relative to worlds and times (or situations) other than those with respect to which the rest of the clause they appear in is evaluated (Fodor, 1970; Enç, 1981).^{1,2} Furthermore, Fodor already showed that this possibility cannot (or not solely) be due to these DPs taking higher scope than the embedding modal operator at the level of logical form, as there are interpretations that would require one scope position to appropriately capture the quantificational scope of a DP, and another to interpret it in the appropriate world. One type of example where such an interpretation arises and which Fodor considered is represented by (4).³

- (4) Mary wants to buy a hat just like mine.

Fodor points out that sentences like (4) can be true in a scenario where Mary has not yet picked out a specific hat she wants to buy, but knows what kind of hat she wants to buy, which happens to be the kind of hat that I have. Making the standard assumption that attitude verbs like *want* (as well as modals) involve quantification over possible worlds, this means that, on the one hand, *a hat just like mine* cannot have wide scope with respect to *want*, since it is not the case that there is some particular hat that she wants; on the

¹What follows is by no means a comprehensive overview of the examples in the literature. See Keshet (2008) for a recent review of the relevant evidence.

²As it will be crucial for the discussions to come to distinguish clearly between DPs and NPs, I will refrain from using the spelled out label ‘noun phrase’ in the text to avoid potential confusion of the two levels. Of course, many of the original works discussed here predated the notion of determiner phrases and thus didn’t use this terminology.

³Schwager (2010) argues that this particular type of example actually does not support the notion of transparent interpretations, but she acknowledges that other examples do, so I will leave this issue aside here.

other hand, *a hat just like mine* has to be interpreted relative to the actual world, and not relative to Mary’s ‘desire-worlds’, since the type of hat she wants matches my hat in the actual world. Thus, the latter effect cannot be brought about by scoping the noun phrase above the attitude verb.

A similar issue arises with so-called scope paradoxes in conditionals (von Stechow, 1984; Abusch, 1994; Percus, 2000; Keshet, 2008), e.g., in (5):

- (5) If everyone in this room were outside, the room would be empty.
(Percus, 2000)

The quantificational DP *everyone in this room* cannot be interpreted in the same world as the predicate in the *if*-clause (*be outside*), since the two are incompatible. But it also can’t be interpreted with scope over the *if*-clause, because that (in addition to raising syntactic worries) would yield the incorrect reading that for each individual person actually in this room it holds that if this person were outside, the room would be empty. These types of examples thus seem to be cases where a DP (that remains within its original clause at LF) is interpreted relative to a possible world that is different from the possible world with respect to which the main predicate of its clause is evaluated.

While the above examples would traditionally be seen as involving the possible world parameter of the relevant predicates, similar effects arise with respect to the temporal interpretation of DPs relative to the tense of a sentence as well, as illustrated by the following types of example:⁴

- (6) Every congressman who remembers a president will be at the party.
(Cooper, 1978)
- (7) a. Every fugitive is now in jail.
b. John will meet every hostage at the president’s party.
(Enç, 1986)
- (8) a. Between 1990 and 1995, John always took a woman his same weight to the world series.
b. When everyone in this room was outside, it was empty.
(Keshet, 2008)

About (6), Cooper notes:

“I believe that this sentence could be said now about a time in the future after the presidency has been abolished. The sentence might indicate plans for a future reunion of elderly congressmen who remember the days when there were presidents.”

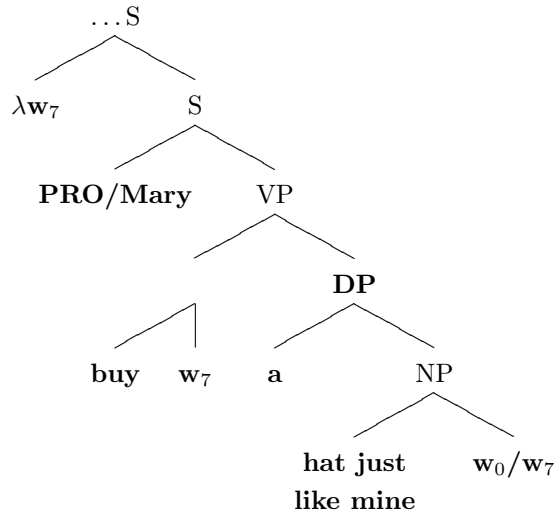
(Cooper, 1978, p. 153)

Similarly, in (7a), the relevant people which are said to be in jail are no longer fugitives at the present time (given the present tense on the verbal predicate). Nonetheless, the sentence has a coherent interpretation. Again, the basic effect we observe is that the predicate in the DP is evaluated at a different time than the predicate of its clause. Finally, the temporal examples in (8) mirror the effects seen in the modal domain based on (4) and (5).

⁴For a recent and detailed presentation of parallel effects for times and worlds, see Keshet (2008).

The standard solution for capturing the independence of the possible world argument of nominal predicates is to assume that all predicates contain an unpronounced, but syntactically represented, possible world pronoun, which saturates the world argument of the predicate (Percus, 2000; von Stechow and Heim, 2007). This pronoun can then be bound by different λ -abstractors (following Heim and Kratzer, 1998, in representing these in the structure), which has the desired effect of (partially) disentangling quantificational scope of a DP from the intensional status of its nominal predicate, as in the LF for the embedded clause in (4) that is sketched below:⁵

- (4) Mary wants to buy a hat just like mine.
 (9) a. $\llbracket \text{buy} \rrbracket = \lambda w. \lambda y. \lambda x. x \text{ buys } y \text{ in } w$
 b. $\llbracket \text{hat} \rrbracket = \lambda w. \lambda x. x \text{ is a hat in } w$
 (10)



Depending on the indexing on the pronoun inside of the NP, *a hat just like mine* will receive a transparent or opaque interpretation.

As the analysis to be spelled out here will be cast in a situation semantics, I will assume that what we are dealing with are situation (rather than world) pronouns which saturate the situation argument of the nominal predicate.⁶ Since situations have a temporal dimension as well, these will also be responsible for the parallel effects in the temporal domain.

There is an important terminological and conceptual distinction that I'd like to highlight, as it is crucial for much of what is to come, namely that between semantic situation arguments and syntactically represented situation pronouns. While my analysis will assume that all predicates have a semantic situation argument (i.e., that the descriptions of the functions they denote include a λs at some point), these do not necessarily get saturated by

⁵Here and below I follow the convention of using the subscript '0' on world and situation pronouns to indicate that their value is the world or situation that the entire sentence is evaluated in.

⁶As far as I can tell, there is no widely accepted standard terminology in the situation semantic literature for these notions (Barwise and Perry, 1983; Cooper, 1993, 1995; Kratzer, 2007). The term 'resource situation' sometimes is used to refer to the situation argument of noun phrases, but sometimes also to refer to a contextually salient situation that can serve as the value assigned to the situation pronoun by the assignment function.

syntactically represented situation pronouns.⁷ The term ‘situation pronoun’ will be reserved for syntactically represented situation pronouns.

Situation pronouns are interpreted just like personal pronouns, understood as a variable, and can therefore be bound or be assigned a value by a contextually supplied assignment function (using the Pronouns and Traces Rule in (24c) below). Assuming (a simplified version of) a semantics of counterfactuals and suitable binding mechanisms (details of implementation will be introduced below), a sentence such as (5), for example, could receive truth conditions along the lines of (11), based on a logical form that includes a situation pronoun inside of the noun phrase, as indicated in (5’):

(5’) If [everyone in this room s] were outside, the room would be empty.

(11) For any situation s , (5’) is true in s iff for every accessible situation s' such that everyone in this room in s is outside in s' , this room is empty in s' .

(adapted from Percus, 2000)

Other examples involving different types of expressions introducing quantification over situations can be captured along similar lines. I will adopt the convention of referring to cases where the situation pronoun on a noun phrase in the scope of an intensional operator is interpreted relative to a situation introduced in a higher clause as *transparent* interpretations. Cases where it is bound by an intensional operator will be referred to as *opaque* interpretations.

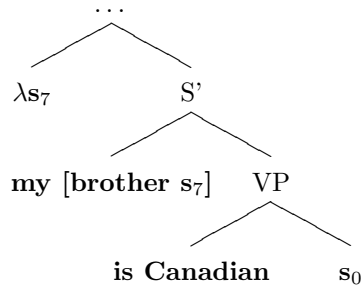
2.3 Restrictions on Situation Pronouns

2.3.1 Generalization X (Percus, 2000)

While the expressive power gained by representing situation pronouns in the syntactic structure allows us to capture transparent interpretations, it turns out to introduce a problem of overgeneration, as was first discussed in detail by Percus (2000).⁸ In particular, if we assume that all predicates come with a syntactically represented situation pronoun, we expect - barring further assumptions - transparent interpretations to be available for all predicates. This expectation is not borne out, however, as Percus shows in great detail.

A case in point are the situation pronouns introduced with verbal predicates. Percus provides the example in (12a) and considers the LF in (12b).

- (12) a. Mary thinks that my brother is Canadian.
 b. *



⁷In fact, they never get saturated by a situation pronoun directly, as these are introduced as arguments of determiners.

⁸Percus notes that he is not the first to point this out, but doesn't refer to any previous published work.

On the given indexing of the pronouns, “we would take the sentence to be true whenever there is some actual Canadian who Mary thinks is my brother - even when this person is not my brother in actuality, and even when Mary mistakenly thinks that he is not Canadian.” (Percus, 2000, p. 200) However, in such a situation we clearly judge the sentence to be false, which shows that the indexing in the LF in (12b) is not available. Percus concludes that there is a general constraint on the interpretation of situation pronouns introduced with verbal predicates, which he labels ‘Generalization X’:⁹

(13) *Generalization X:*

The situation pronoun that a verb selects for must be coindexed with the nearest λ above it.

(Percus, 2000, p. 201)

While this generalization adequately captures a restriction on the interpretation of situation pronouns, it remains at a purely descriptive level (though Percus does consider possible lines of argument for an explanation of why it might exist). Accounting for it constitutes a challenge for an intensional semantic theory of natural language.

2.3.2 Generalization Z and the Intersective Predicate Generalization

Building on Percus’s insights, Keshet (2008, 2010a) argues for a further restriction on the interpretation of situation pronouns, which concerns the distinction between weak and strong DPs. As is standard, weak DPs are understood to be precisely those that can appear in existential *there* constructions, following Milsark (1977). A note on terminology: in the literature, sometimes the relevant determiners are called weak, and sometimes the entire DPs are. I will adopt the convention of calling a determiner weak if it can appear in a weak DP. DPs occurring in contexts like the existential *there*-construction are weak, but this does not exclude the possibility of homophonous variants that receive strong interpretations in other contexts.

The starting point for this line of thought comes from Musan (1995), who showed that not all noun phrases display temporal independence (contra Enç, 1986):

(14) a. Every fugitive is in jail.

b. #There is a fugitive in jail. (Musan, 1995; Kusumoto, 2005)

(15) Some members of congress knew each other in college. In fact, ...

a. ... three U.S. Senators were attending Harvard together in 1964.

b. #... there were three U.S. Senators attending Harvard together in 1964.

(Keshet, 2008, adapted from Musan)

The contrast observed in both of these pairs of examples is that while the (a)-sentences have a perfectly reasonable interpretation, which comes about by interpreting the nominal

⁹Percus also makes a parallel point for adverbs, based on parallel data, which won’t play a central role in my discussion:

(i) *Generalization Y:*

The situation pronoun that an adverbial quantifier selects for must be coindexed with the nearest λ above it.

(Percus, 2000, p. 204)

predicate at a time different from that of the verbal predicate in its clause, the existential *there* variants in (b) have no sensible interpretation. (14b) is contradictory, and the continuation in (15b) only has the implausible interpretation that the relevant individuals were U.S. Senators while attending Harvard in 1964.

Keshet (2008, 2010a) furthermore showed that this effect, too, is paralleled in the domain of possible worlds:

- (16) a. **Mary thinks that someone in this room is outside.**
 b. **#Mary thinks there's someone in this room outside.**
- (17) a. **Mary thinks three professors are (still) in college.**
 b. **#Mary thinks there's three professors still in college.**
- (both examples from Keshet, 2008, p. 48)

Both (16b) and (17b) are odd in that they can only be understood as attributing inconsistent (or implausible) beliefs to Mary, unlike their counterparts in the (a)-sentences. This shows that the predicates of weak DPs have to be interpreted relative to the same situation as the verbal predicate in their clause, i.e., in Mary's 'thought-worlds' in the present sentences. Keshet proposes to add a further generalization based on these findings:

- (18) *Generalization Z:*
 The situation pronoun selected for by a noun in a weak NP must be coindexed with the nearest λ above it. (Keshet, 2008, p. 126)

Adopting Landman's (2004) proposal of seeing weak DPs as denoting predicates, Keshet (2010a) argues that Generalization Z is a special case of a more general constraint that requires any two predicates that are interpreted intersectively to be evaluated relative to the same world and time (or situation):¹⁰

- (19) *Intersective Predicate Generalization (IPG):*
 Two predicates interpreted intersectively may not be evaluated at different times or worlds from one another. (Keshet, 2010a)

In addition to the existential *there*-construction, where the nominal and verbal predicates arguably are interpreted intersectively, Keshet (2008, 2010a) presents evidence for this with examples involving nouns and their modifiers, the *have*-construction, and depictives. Take the following examples of the first case as a brief illustration:

- (20) a. **#In 1964, every U.S. Senator at Harvard got straight A's.**
 b. **#Mary thinks the married bachelor is confused.**
- (Keshet, 2010a)

In (20a), the noun *U.S. Senator* and the prepositional phrase *at Harvard* are interpreted intersectively, and the sentence only has a reading where the relevant individuals were senators and at Harvard at the same time. Similarly, the adjectival modifier *married* and the noun *bachelor* are interpreted intersectively, and (20b) can only be interpreted as attributing inconsistent beliefs to Mary.

¹⁰Note that relative clauses constitute an important exception to this generalization (as Keshet points out as well). See the related discussion in section 5.

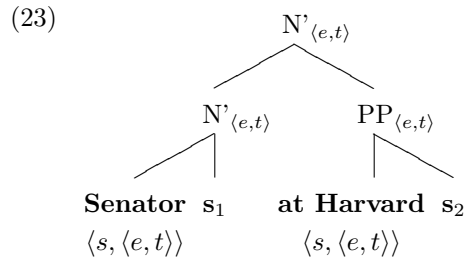
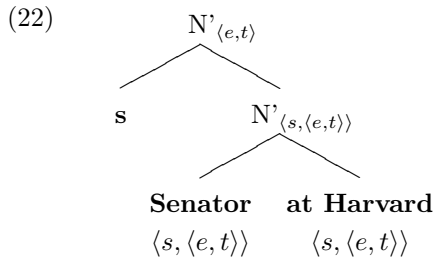
Like Generalization X, the restriction captured by the IPG is not built into the intensional semantic system standardly considered in this context. In particular, assuming Keshet’s (2008) Free Situation Pronoun Hypothesis in (21),

(21) *Free Situation Pronoun Hypothesis:*

A situation pronoun may be freely inserted and indexed wherever it is the complement to a node of type $\langle s, \alpha \rangle$.

(Keshet, 2010a)

two types of structures are in principle possible for a noun-modifier configuration:



But if the structure in (23) is a real possibility, then additional constraints will be needed to ensure the IPG, i.e., to exclude the possibility that the two situation pronouns in (23) are bound by different λ -abstractors.

To summarize the challenge faced by the data considered so far: in order to capture transparent interpretations of DPs, we need to assume situation pronouns that are syntactically represented in the structure and which can be bound and quantified over. However, assuming that all predicates that have a semantic situation argument take such a situation pronoun as a complement leads to a problem of overgeneration, as the situation pronouns of verbs and weak DPs need to be bound by the closest λ -abstractor (Generalizations X and Z Percus, 2000; Keshet, 2010a). Furthermore, intersectively interpreted predicates have to be interpreted relative to the same situation (IPG Keshet, 2008, 2010a). My analysis, which is based on the idea that situation pronouns only occur in special places in the syntactic structure, and are not introduced with every predicate, is spelled out in the following section. Next, I compare it briefly to the central features of the other accounts in the literature (Keshet, 2008, 2010a,b).

3 Situation Pronouns as Arguments of Determiners

The strategy behind the proposal to be spelled out is based on the idea that while all predicates come with a semantic situation argument, we should only assume syntactically represented situation pronouns where we have evidence for them. The only such place, based on the data to be considered here, will be inside of strong DPs (see section 5 for discussion of further candidate locations for situation pronouns). I develop a semantic system that takes this idea as a starting place.

In the next subsection, I will introduce my basic assumptions about the semantic system. I will then present two arguments for introducing situation pronouns as arguments of determiners, rather than inside of NPs proper. In considering the implications of this setup for our semantic system, I will introduce situation binders as proposed by Buring (2003).

Finally, I will show that the restrictions for transparent interpretations discussed above fall out from the system automatically, without requiring any further constraints.

3.1 Basic Assumptions About the Semantic System

I will use a possibilistic situation semantics based on Kratzer (1989), which makes the following assumptions: The meaning of a sentence is a proposition, understood as a set of possible situations (or their characteristic functions). Situations are seen as particulars (unlike in other situation semantic frameworks, e.g., Barwise and Perry, 1983), and are parts of worlds. Worlds are maximal situations, i.e., situations that are not a proper part of any other situation. I will refer to the world that a given situation s is part of as w_s . Any situation, as well as any individual, can only be part of one world. This means that we need the notion of counterparts in the sense of Lewis (1986) in order to talk about ‘corresponding’ individuals (or situations) across different possible worlds. Since counterparts do not play a central role for the discussions to come, I will mostly ignore this complication.¹¹ The situations that are part of a world form a mereological part structure, i.e., we can form the mereological sum of any two situations that belong to the same world. The corresponding part relation will be expressed by \leq (where ‘ $s \leq s'$ ’ is to be read as ‘ s is a part of s' ’).¹²

To compose the meanings of complex expressions from the meanings of their parts, I will assume a system of direct interpretation with rules that are more or less standard, namely the following (adapted with slight changes from Heim and Kratzer, 1998; von Stechow and Heim, 2007):

- (24) a. **Functional Application (FA)**
 If α is a branching node and β, γ the set of its daughters, then, for any context c and any assignment g , α is in the domain of $\llbracket \]^{c,g}$ if both β and γ are, and $\llbracket \beta \rrbracket^{c,g}$ is a function whose domain contains $\llbracket \gamma \rrbracket^{c,g}$. In that case, $\llbracket \alpha \rrbracket^{c,g} = \llbracket \beta \rrbracket^{c,g}(\llbracket \gamma \rrbracket^{c,g})$.
- b. **Predicate Modification (PM)**
 If α is a branching node and β, γ the set of its daughters, then, for any context c and any assignment g , α is in the domain of $\llbracket \]^{c,g}$ if both β and γ are, and $\llbracket \beta \rrbracket^{c,g}$ and $\llbracket \gamma \rrbracket^{c,g}$ are of type $\langle e, \langle s, t \rangle \rangle$. In that case, $\llbracket \alpha \rrbracket^{c,g} = \lambda x. \lambda s. \llbracket \beta \rrbracket^{c,g}(x)(s) \ \& \ \llbracket \gamma \rrbracket^{c,g}(x)(s)$
- c. **Pronouns and Traces**
 If α is a pronoun or a trace, g is a variable assignment, and $i \in \text{dom}(g)$, then $\llbracket \alpha_i \rrbracket^{c,g} = g(i)$.
- d. **Predicate Abstraction**
 For all indices i and assignments g , $\llbracket \lambda_i \alpha \rrbracket^g = \lambda x. \llbracket \alpha \rrbracket^{g^{x/i}}$

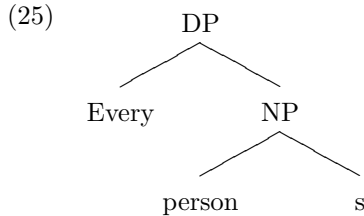
3.2 Arguments for Introducing Situation Pronouns at the level of the DP

The arguments for situation pronouns inside of DPs based on transparent interpretations only require that there be a situation pronoun somewhere inside of the DP. One important

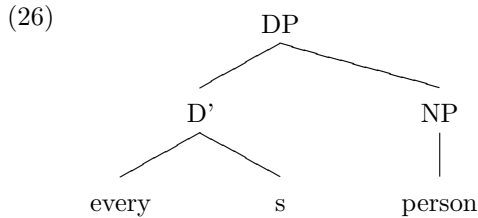
¹¹For further details on the ontological commitments one has to make in this type of system, see Kratzer (1989).

¹²‘ \leq ’ can be defined in terms of the mereological sum operation: $s \leq s'$ iff $s + s' = s'$. Importantly, however, the part relation is restricted in that it only can hold between worldmate situations.

question is where exactly in the structure this pronoun actually appears. While some authors, such as Percus (2000), remain neutral in this regard, others have made more specific assumptions. Kratzer (2004) and von Stechow and Heim (2007), for example, assume that situation pronouns appear inside of the NP, so that determiners combine with an object of type $\langle et \rangle$:¹³



It is perfectly conceivable as well, however, that the situation pronoun is introduced with the determiner. This is the option chosen by Büring (2004).¹⁴



Is there any reason to prefer one version over the other? Within a situation semantics, I'd like to argue that there are at least two reasons for choosing the latter option. The first concerns an argument about the truth conditions of sentences involving temporally independent interpretations of quantificational DPs (as in (7a)), due to Kusumoto (2005). The second is based on the fact that quantification in a situation semantics requires some notion of minimality for the situations quantified over in the restrictor of the quantifier, e.g., for the analysis of donkey sentences. In addition to these general considerations, choosing the option in (26) will allow us to build a semantic system in which the restrictions on transparent interpretations discussed above fall out for free.

Based on examples such as (7a), repeated below, Enç (1986) argued that the NP contains a temporal pronoun whose value is contextually supplied, i.e., a version of the structure in (25). However, Kusumoto (2005) argues that the truth conditions based on such an analysis, which she assumes to be as in (27), are insufficient in that they make false predictions for certain scenarios.

(7a) Every fugitive is in jail.

- (27) a. $[_{TP} t^* \text{ PRES} \lambda_2 \text{ pres}_2 [_{VP} [_{NP} \text{ Every } [t_3 \text{ fugitive}]] \text{ be in jail}]]$
 b. $\llbracket (27a) \rrbracket^{g,c}(w) = 1$ iff there is a time t' overlapping s^* such that for every (contextually salient) individual x such that x is a fugitive at $g_c(3)$ in w , x is in jail at t' in w .

(Kusumoto, 2005, p. 342, underlining added for emphasis, FS)

¹³See also Keshet (2010a), who argues for the Extensional Type Hypothesis in (48), discussed in section 3.5.

¹⁴Note that Büring introduces the situation pronoun as an index on the determiner, rather than in a separate node of its own.

Crucially, on this view the noun *fugitive* combines with a temporal pronoun t_3 , which receives a value via the assignment function. Kusumoto provides the following scenario to illustrate the insufficiency of these truth conditions:

Suppose that there is a group of five people who were fugitives at different times in the past but are currently in jail. Under this scenario the sentence can still be truthfully uttered. If the time argument of a noun is represented as a free time variable whose value is contextually determined, the value assigned cannot vary from one fugitive to another.

(Kusumoto, 2005, p. 342)

The conclusion Kusumoto draws from this is that there are no temporal pronouns inside of NPs. Note that in order for this conclusion to be valid, we have to make the assumption that in order for $fugitive(x)(s)$ to hold, x has to be a fugitive *throughout* s .¹⁵ While I'm not aware of any discussion of this particular issue in the literature, there is at least one argument in support of this assumption that Roger Schwarzschild has made in lecture notes. As we saw in the discussion of the IPG above, nouns and their modifiers have to be interpreted relative to the same situation. While it may seem that to bring this about, it suffices to ensure that there is only one situation pronoun for the entire NP (as in the structure in (22) above), the present assumption is actually necessary as well. Otherwise, an NP such as *Senator at Harvard* could hold of an individual x in a situation s if x was a senator and at Harvard at different times, as long as the temporal extension of s is sufficient in size. But assuming that the predicate has to hold throughout the entire situation, e.g., that $Senator(x)(s)$ holds only if x is a senator throughout s , will indeed ensure the co-temporal interpretation of nouns and their modifiers. Based on this reasoning, I fully agree with Kusumoto in seeing the provided scenario as an argument against time (or situation) pronouns inside of the NP proper.

Kusumoto's analysis, following Musan (1995), then is to assume that quantifiers like *every* introduce existential quantification over the temporal argument of their restrictor predicate, as in (28), which yields the truth conditions in (29) for (7a).

- (28) $\llbracket every \rrbracket^g =$
 $\lambda P \in D_{\langle e, \langle i, \langle st \rangle \rangle \rangle} \cdot [\lambda Q \in D_{\langle e, \langle i, \langle st \rangle \rangle \rangle} \cdot [\lambda t \in D_i [\lambda w \in D_s [\text{for every individual } x \text{ such that there is a time } t' \text{ such that } P(x)(t')(w) = 1, Q(x)(t)(w) = 1]]]]]$
- (29) a. $[_{TP} t^* \text{ PRES } \lambda_2 \text{ pres}_2 [_{VP} \text{ Every fugitive be in jail}]]$
 b. $\llbracket (29a) \rrbracket^{g,c}(w) = 1$ iff there is a time t' overlapping s^* such that for every (contextually salient) individual x such that there is a time t'' such that x is a fugitive at t'' in w , x is in jail at t' in w .

(Kusumoto, 2005, p. 343)

These truth conditions correctly predict (7a) to be true in Kusumoto's scenario, as they simply require that for each of the people quantified over, there is some time at which they were fugitives.

While Kusumoto's scenario presents a convincing argument against assuming a temporal (or situation) pronoun inside of the NP, it doesn't preclude the possibility of introducing one with the determiner. This pronoun can serve to restrict the existential quantification

¹⁵Thanks to Sigrid Beck (p.c.) for pointing out the importance of this assumption, and to Roger Schwarzschild (p.c.) for sharing his lecture notes in which he makes the argument presented in what follows.

over times that binds the semantic situation argument of the NP predicate. A situation semantic version of this analysis would look as follows:¹⁶

$$(30) \quad \llbracket \textit{every} \rrbracket^g = \lambda s'. \lambda P. \lambda Q. \lambda s. \forall x [\exists s'' [s'' \leq s' \ \& \ P(x)(s'')] \rightarrow Q(x)(s)]$$

$$(31) \quad \llbracket (29a) \rrbracket^{g,c} = \lambda s. \forall x [\exists s'' [s'' \leq g(1) \ \& \ \textit{fugitive}(x)(s'')] \rightarrow \textit{in-jail}(x)(s)]$$

The first argument of *every* here would be a syntactically represented situation pronoun, which will be assigned some particular situation as a value by the assignment function.¹⁷ This situation could be located in the past, and the existential quantification over parts of it will provide the correct truth conditions for Kusumoto’s scenario, while at the same time making use of a contextually supplied situation that provides the broader situational frame inside of which these people were fugitives (if possibly at different times inside of that frame). The presence of the situation pronoun is crucial for capturing the intuitively present domain restriction effect - we are not universally quantifying over all individuals that were (or are or will be) fugitives at some point in time (see section 4 for a general account of domain restriction based on situation pronouns). Mere existential quantification over the situation argument of the restrictor predicate, as Musan and Kusumoto propose for the temporal argument, would not be of much help in this respect.

With respect to the issue of the location of situation pronouns, this discussion provides an argument against analyses that assume them to be introduced within the NP proper, as an argument of the noun (or some nominal projection). In order for the determiner to introduce quantification over times at which the nominal predicate holds, it has to combine with a property, i.e. something of type $\langle e, \langle s, t \rangle \rangle$ (or $\langle e, \langle i, t \rangle \rangle$).¹⁸ Since we still need situation pronouns somewhere in the DP to account for transparent interpretations, this leaves us with the option of introducing situation pronouns as arguments of determiners, i.e., option (26) above. The additional benefit of automatically capturing domain restriction effects further supports this view. Note also that this option will provide a natural way of distinguishing weak and strong DPs from one another (see section 3.4).

The second argument against introducing situation pronouns inside of the NP proper comes from a situation semantic analysis of donkey sentences. Note that I do not see this argument as exclusively dependent on the need for (or success of) situation semantic accounts for donkey sentences with pronouns, as parallel data with full definite descriptions provide a motivation of their own for such an analysis (Schwarz, 2009). In particular, what Schwarz calls the ‘weak article-definites’, which are argued to be based on uniqueness, receive a natural treatment in a situation semantics, which automatically includes an account of their donkey anaphoric uses within the type of proposal considered here (for details, see Schwarz, 2009, Chapter 4).

In turning to the argument I’m about to make, we again have to look at the semantics of determiners. For a number of reasons, quantificational determiners are commonly argued to involve quantification over both individuals and situations. But they can’t just be seen as quantifying over any situations that contain the individuals and properties introduced

¹⁶This is not intended as a full proposal, but rather as a rough illustration of the type of approach I will develop below, which remains at least somewhat close to Musan’s and Kusumoto’s proposals.

¹⁷Note that while I will assume the situation pronoun to be the determiner’s first argument, I don’t currently see any reason that rules out other orders of arguments. What matters is that the situation pronoun is an argument of the determiner.

¹⁸The present discussion does not bear on the issue of whether these orderings or Schönfinkled variants thereof (e.g., $\langle s, \langle e, t \rangle \rangle$) are what is needed, but the system I will develop below will be based on the type-variant in the main text.

in the restrictor. Rather, it is standard to assume, at least since Berman (1987), that they quantify over situations that are, in some sense, minimal. For example, situation semantic accounts provide truth conditions for donkey sentences such as (32a) along the lines of (32b) (Berman, 1987; Heim, 1990; Elbourne, 2005).

- (32) a. Every farmer who owns a donkey beats it.
 b. For any situation s , (32a) is true in s iff
 for every individual x and every situation $s' \leq s$
 such that s' is a minimal situation
 such that there is a donkey y and x is a farmer who owns y in s'
 there is a situation s'' such that $s' \leq s'' \leq s$ and x beats the unique
 donkey in s''

While I take the appropriate notion of minimality to be that of *exemplification* (Kratzer, 2007), the crucial point for the current discussion is that any relevant notion of minimality will express a relation between propositions (i.e., sets of situations or their characteristic functions) and situations. In order to derive an interpretation of quantificational sentences along the lines of (32b), denotations of quantificational determiners will have to be able to access a proposition derived from the property denoted by the restrictor. A meaning for *every* that is appropriate for donkey sentences is provided in (33), which includes (something like) the underlined condition in its restrictor:^{19,20}

$$(33) \quad \llbracket \text{every} \rrbracket = \lambda s_r. \lambda P_{\langle e, st \rangle}. \lambda Q_{\langle e, st \rangle}. \lambda s. \forall x \forall s_1 \left[\left[s_1 \leq s_r \ \& \ \underline{EX(P(x))(s_1)} \right] \rightarrow \exists s_2 [s_1 \leq s_2 \leq s \ \& \ Q(x)(s_2)] \right]$$

Assuming *EX* to express an appropriate notion of minimality (e.g., where ‘*EX(S)(s)*’ is to be read as ‘*s* exemplifies the proposition *S*’), this will provide the desired effect, as *P(x)* will give us a proposition derived from the property *P* (of type $\langle e, \langle s, t \rangle \rangle$), given the individual argument x .

For this to be possible, it is crucial, however, that the argument that a quantificational determiner like *every* takes is a property (i.e., of type $\langle e, st \rangle$), rather than having an extensional type $\langle e, t \rangle$. If we introduce a situation pronoun inside of the NP, however, as in the structure in (25), all that the determiner can derive is a set of individuals (i.e., its complement will be of type $\langle e, t \rangle$), which does not allow us to access a proposition based on the meaning of the restrictor.

If we assume situation pronouns to be introduced at the level of the DP, as in (26), on the other hand, the restrictor argument of the quantificational determiner will be a property (of type $\langle e, st \rangle$). Such an account thus is compatible with a situation semantic analysis of donkey sentences. Any situation semantic account that assumes situation pronouns inside

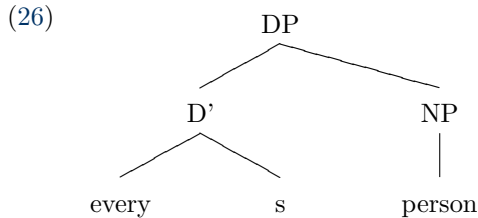
¹⁹Note that this is a straightforward extension of the *every* needed for the Kusumoto example above, as (30) is equivalent to (30') (by laws of quantifier movement in predicate logic):

$$(30) \quad \llbracket \text{every} \rrbracket^g = \lambda s'. \lambda P. \lambda Q. \lambda s. \forall x [\exists s'' [s'' \leq s' \ \& \ P(x)(s'')] \rightarrow Q(x)(s)]$$

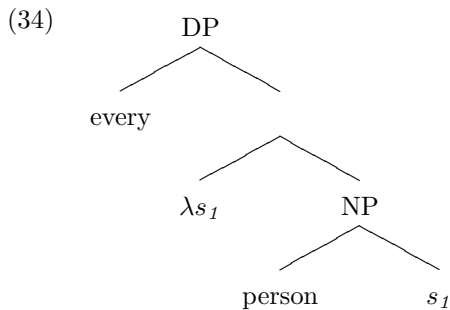
$$(30') \quad \llbracket \text{every} \rrbracket^g = \lambda s'. \lambda P. \lambda Q. \lambda s. \forall x \forall s'' [s'' \leq s' \ \& \ P(x)(s'')] \rightarrow Q(x)(s)]$$

²⁰More needs to be said about the consequent in the meaning of *every*. To adequately capture transparent interpretations in donkey sentences, we need to introduce something like a counterpart-part relation, so that the situations quantified over in the consequent don't have to be part of the same world as the situations quantified over in the restrictor. See Schwarz (2009, Chapter 4) for some discussion of this issue.

of DPs and that introduces quantification over ‘minimal’ situations in the meanings of quantificational determiners therefore will have to adopt (a version of) the structure in (26) - repeated here for convenience -, i.e., locate situation pronouns at the level of the DP.



In evaluating the force of the arguments just presented for this structure, it is worth considering a possible alternative that would be compatible with the basic aspects of these arguments.²¹ The main point of both of the arguments was that determiners need to combine with complements of an intensional type, e.g. $\langle e, \langle s, t \rangle \rangle$ or $\langle s, \langle e, t \rangle \rangle$. It is, in principle, perfectly possible to ensure this even if there is a situation pronoun present in the NP itself. In particular, in a system that includes λ -abstractors over situations in the syntactic structure, the meaning of the NP could be turned into a property by introducing such a λ -abstractor above the NP (perhaps its introduction could be attributed to the determiner):



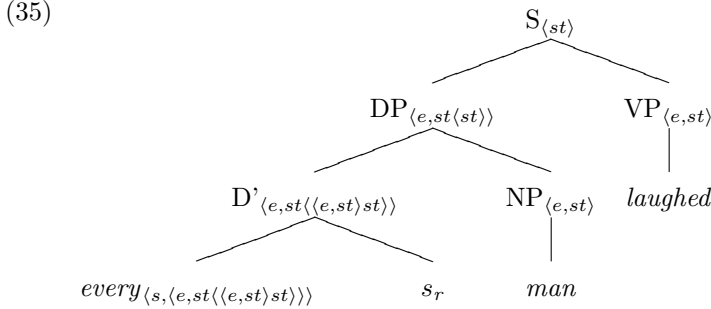
However, this option runs into a number of problems given the data we are (and will be) considering. We presumably would want to exclude the possibility of vacuous binding by the λ -abstractor introduced above the NP. If this is so, that means that the situation pronoun in (34) has to be bound locally, and cannot remain free or be bound by a higher λ -abstractor. But that is, of course, exactly what is needed in order for this pronoun to make transparent interpretations possible. Similarly, as I will argue in section 4 (and as we already saw briefly in connection with Kusumoto’s scenario above), situation pronouns provide all that is needed to account for contextual domain restriction. But in order to allow for the flexibility in domain restriction that is needed to account for all the data, we have to allow this situation pronoun to be free (or be bound by a higher operator). Finally, an important argument in favor of introducing situation pronouns with the determiner is that it provides us with a straightforward way of distinguishing strong and weak determiners. Again, assuming a situation pronoun inside of the NP does not seem to provide us with the same means.

²¹Thanks to Angelika Kratzer (p.c.) for pointing this out to me.

So while the two arguments presented here do not by themselves completely rule out the possibility of structures like (34), I conclude that once we take into consideration the bigger picture of what situation pronouns can and should do for us, the case for the structure in (26), where situation pronouns are introduced with the determiner, is very strong.

3.3 The Semantic System beyond DPs: Situation Binding

I will now introduce the semantic system that incorporates the DP-meanings introduced in the last section. Note that for the purposes of the present article, the main concern are syntactically represented situation pronouns inside of DPs, and I will thus ignore, for the most part, situation pronouns in other places. In particular there may be good reason to think of Austinian topic situations as syntactically represented (Kratzer, 2007; Schwarz, 2009), but I leave the detailed argumentation for this to another occasion (see section 5 for some further discussion of other locations for situation pronouns). For the present discussion, I will simply assume that when one asserts a proposition, this is interpreted as making a claim about some particular situation, which I will refer to as the topic situation (Barwise and Etchemendy, 1987; Kratzer, 2007). In the structures discussed below, this will correspond to the situation associated with the λ -abstractor over situations at the level of the entire sentence. The basic structure of a simple sentence will be as follows:



To aide readability, I will use s_r for resource situation pronouns in DPs, but there is no special status attached to this notation. It should be considered as a notational variant of standard indexed variables (I'll assume that r can receive a value via the assignment function g or be bound, just like regular indices represented by the natural numbers).

The lexical entries for nouns and verbs will be standard (36, 37). The full meaning of quantificational determiners gets somewhat complex once we take all issues into consideration (see (33), and discussion below). For ease of presentation, I will allow myself to work with oversimplified entries, such as the one in (38) for *every* when this causes no harm for the point under consideration.²²

$$(36) \quad \llbracket laugh \rrbracket = \lambda x \in D_e. \lambda s \in D_s. \text{ laugh}(x)(s)$$

$$(37) \quad \llbracket man \rrbracket = \lambda x \in D_e. \lambda s \in D_s. \text{ man}(x)(s)$$

²²Here and in the following, I will adopt the convention of omitting the superscripts c and g on the interpretation function when the expressions that are being evaluated by it are not sensitive to them. I also will omit the explicit representation of types of variables when the type of the variable is clear from the context. The notation I use for predicates, such as 'laugh(x)(s)', is to be understood as a short form for ' x laughs in s '.

b. ... [... OP [VP ... [[D s_r] NP] ...]]

To derive opaque readings, we also need to make use of Σ , as they require the situation pronoun in noun phrases to be bound by an intensional operator. To achieve this, Σ has to be adjoined below the intensional operator, as in the following schema.

(43) ... OP [Σ_r [VP ... [[D s_r] NP] ...]]

The system presented here thus allows us to capture both transparent and opaque interpretations, as well as providing us with the option of interpreting situation pronouns relative to a topic situation or a contextually salient situation, which will be important in the discussion of domain restriction in section 4. That section will also spell out a more detailed example of how these various options play out in the semantic computation.

3.4 Accounting for the Restrictions

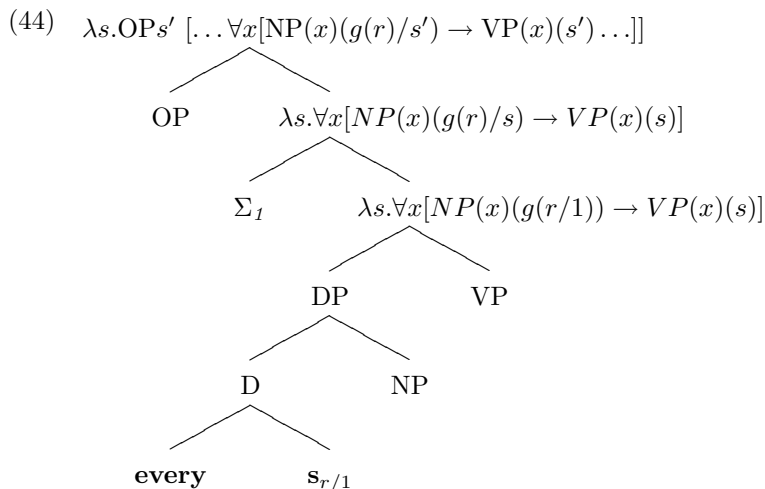
Now that we have seen how transparent and opaque interpretations come about in our system, let us return to the restrictions on transparent interpretations observed by Percus (2000) and Keshet (2008). Percus's Generalization X for verbs, repeated below for convenience, captured the fact that verbal predicates cannot receive transparent interpretations:

(13) *Generalization X:*

The situation pronoun that a verb selects for must be coindexed with the nearest λ above it.

(Percus, 2000, p. 201)

This generalization falls out automatically from the way we have set up our semantic system, because verbs do not combine with a syntactically represented situation pronoun in the first place. Since that is the only way a transparent interpretation can arise, it follows that verbal predicates do not have such an interpretation, but rather are 'interpreted relative to the λ -abtractor over situations for the clause they appear in.' In fact, since we do not represent these λ -abstractors in the structure, the semantic situation argument of the verbal predicate simply is bound by the λ -abtractor over situations that is introduced in its lexical entry. The following tree illustrates the situation schematically:

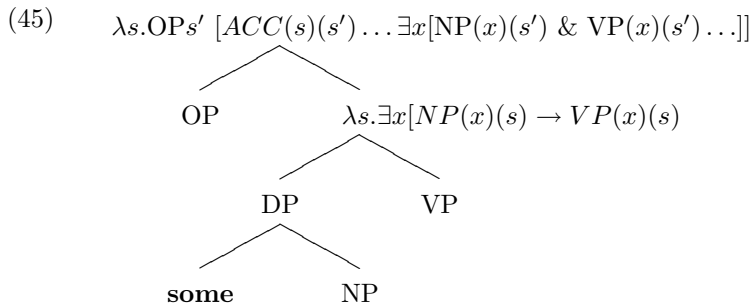


While the situation pronoun introduced with *every* can either receive a value via the assignment function or be bound by an intensional operator (via Σ), the semantic situation argument on the verb inevitably winds up getting bound by the intensional operator.²⁴

Keshet’s (2008) Generalization Z about weak DPs, again repeated below, can also be captured straightforwardly in our system, in at least two ways.

- (18) *Generalization Z:*
 The situation pronoun selected for by a noun in a weak NP must be coindexed with the nearest λ above it. (Keshet, 2008, p. 126)

First, we can simply assume that only the determiners of strong DPs take a situation pronoun as their argument. The schematic illustration below shows that DPs that don’t contain a situation pronoun will automatically be interpreted relative to the same situation as the verbal predicate, and thus yield opaque interpretations in the context of an intensional operator:

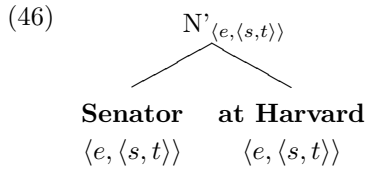


Alternatively we can follow Landman (2004) and Keshet (2010a) in assuming that weak DPs simply denote predicates, which don’t introduce a situation pronoun of their own in my system.

Of course, DPs headed by *some* do not have to receive a weak interpretation, since they can have transparent interpretations in contexts that do not disallow strong DPs. For these, we can simply assume a variant of *some* that does take a situation pronoun argument. The main point here is that since we make the presence of situation pronouns in DPs dependent on the determiner (or the presence of a covert existential closure operator that turns the predicate into a quantifier), different types of determiners can vary with respect to whether or not they combine with such a pronoun. Plenty more needs to be said about the difference between strong and weak DPs, of course. For present purposes, I restrict myself to the point that the differences between them can be captured straightforwardly in the system advanced here (see section 5 for some further discussion of related issues).

Keshet’s (2008) Intersective Predicate Generalization, which states that any two intersectively interpreted predicates have to be evaluated relative to the same situation (or the same time and world) also follows from the way the semantic system is set up: Predicates do not introduce situation pronouns (they’re type $\langle e, st \rangle$). Thus, whenever two predicates are combined intersectively, this is done by combining two expressions of type $\langle e, \langle s, t \rangle \rangle$.

²⁴A parallel story can be told about Percus’s (2000) Generalization Y about adverbs, although I cannot discuss this in detail here.



The two predicates *Senator* and *at Harvard* will then automatically be evaluated relative to the same situation - which situation will depend on the determiner and the interpretation of its situation pronoun (if it introduces one).

3.5 Comparison with Keshet (2010a), Keshet (2010b)

In his dissertation and following work, Ezra Keshet has pursued two approaches of trying to account for the restrictions on transparent interpretations. I will consider these in turn and compare them to the present account.

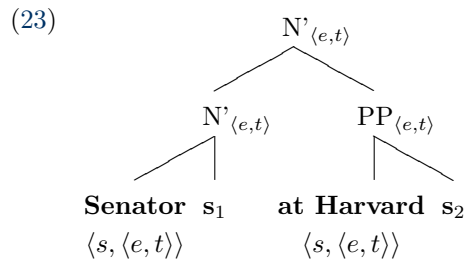
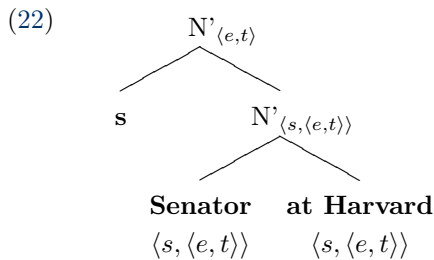
The first account, presented in Keshet (2008, Chapter 3) and elaborated in Keshet (2010a), is based on the notion of *situation economy*, which prefers structures that contain less situation pronouns over comparable ones that contain more (see Keshet, 2010a, for detailed discussion of what structures count as comparable).

(47) *Situation Economy:*

Rule out a structure α if there is a grammatical alternative to α that has fewer situation pronouns.

(Keshet, 2010a)

It accounts for Generalization Z and the IPG in a unified manner by assuming that the existential *there*-construction also involves two predicates being interpreted intersectively. This move is in part made possible by assuming that weak noun phrases are not quantificational at all, but rather just denote properties (following Landman, 2004).²⁵ What needs to be achieved then to account for the phenomena discussed here in terms of Generalization Z and the IPG, amounts to choosing (22) over (23).²⁶ Situation Economy does just that.



Note, however, that Situation Economy has nothing to say about Generalization X about verbs, as verbal predicates are assumed to always combine with a situation pronoun, which is stipulated to be bound by the closest λ -abstractor over situations.

²⁵As noted above, this perspective is compatible with my proposal as well.

²⁶The structures Keshet considers are more complex, as it is the copula verb in the existential *there*-construction that introduces the situation pronoun. The main point, however, is to rule out the possibility of each nominal predicate combining with its own situation pronoun, as in (23).

A further problematic aspect of the general approach within which Situation Economy is situated comes into view when we consider a broader range of data, in particular donkey sentences and Kusumoto’s data from the temporal domain. Keshet (2010a) advances the Extensional Type Hypothesis in (48), which requires all quantificational determiners to combine with expressions of type $\langle e, t \rangle$:²⁷

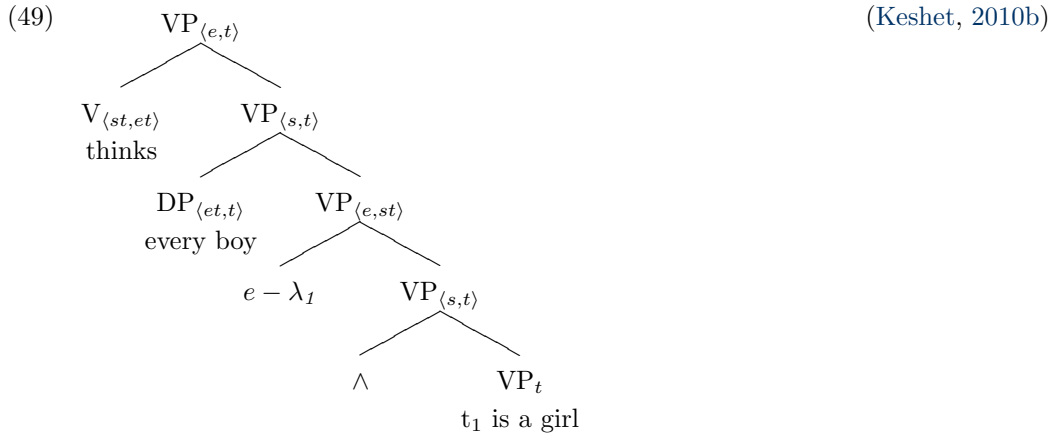
- (48) *Extensional Type Hypothesis* (informal):
 If a lexical item is definable without reference to worlds and times, it cannot take a situation argument.

(Keshet, 2010a)

This forces NPs that are arguments of strong determiners to contain a situation pronoun. However, as I argued in detail in section 3.2, based on evidence from donkey sentences and from the temporal data by Kusumoto (2005), we need determiners to combine with properties, i.e., expressions of type $\langle e, \langle s, t \rangle \rangle$, in order to quantify over situations relative to the nominal predicate and to state the minimality condition required for donkey sentences. Therefore, Keshet’s Situation Economy account is incompatible with accounts for these phenomena (or at least with situation semantic accounts along the lines sketched here). The analysis I spelled out above, on the other hand, accounts for Generalization X (in addition to Generalization Y and the IPG) and is compatible with analyses of donkey sentences and Kusumoto’s temporal data. It thus has better empirical coverage than Situation Economy.

Keshet (2008) himself sees various shortcomings with the Situation Economy account, and develops another approach that constitutes a novel scope-based analysis of transparent interpretations (Keshet, 2008, Chapter 5), which is further developed in Keshet (2010b). As in previous scope accounts (e.g. Ladusaw, 1977; Ogihara, 1992, 1996; Stowell, 1993), there are no syntactically represented situation pronouns. Which situation a predicate is interpreted in is determined by means of a situation parameter on the interpretation function. Modal and temporal operators shift this parameter, and thereby affect the situation (or world or time) of evaluation of the predicates contained in their complement. The crucial twist in Keshet’s split intensionality variant of the account is that he allows quantificational scope and intensional status of a DP to be minimally independent from one another. This is made possible by factoring out the intensional operator ‘ \wedge ’ from modals and attitude verbs into a node of its own, and allowing DPs to take scope above this intensional abstractor but below the modal, as indicated in the following schematic tree:

²⁷See Keshet (2010a, ex. (104)) for a formal version of this hypothesis.



Note that the apparent type-clash between the DP and the VP can be dealt with by using Büring’s (2005) Combine-rule (Keshet, 2010b). This system now can capture the basic phenomena relating to transparent interpretations, where a DP takes quantificational scope below a modal operator while at the same time being evaluated at a situation (or world) introduced in a higher clause. And, remarkably, the system does so without positing syntactically represented situation pronouns. However, it still ties together quantificational scope and transparent interpretations rather tightly. Keshet discusses some of the relevant predictions and sees them as providing support for his approach. I see some problems in this regard, which I will turn to momentarily. But before doing so, let me compare how this account fares in light of the restrictions on transparent interpretations in comparison to the proposal I advanced.

Generalization X, which excludes transparent interpretations of verbs, follows in this system. Transparent interpretations are tied to quantifier movement, and verbs and verbal predicates do not undergo this type of movement. As for Generalization Z and the Intersective Predicate Generalization, the account has the potential to explain these as well (though Keshet does not discuss this in detail in this context): assuming weak noun phrases are not quantificational at all, but rather denote properties (following Landman, 2004, as discussed above), they cannot undergo QR, either, and thus cannot escape the intensional abstractor. In this respect, the account is on par with my proposal, then.

However, once we include donkey sentences and Kusumoto’s temporal data in our considerations, the split intensionality account faces the same difficulties as the Situation Economy account. Determiners once again are assumed to take expressions of type $\langle e, t \rangle$ as their complements, but I showed in section 3.2 that they need to combine with properties (type $\langle e, st \rangle$). Furthermore, my proposal is naturally extended to a situation semantic account of domain restriction, as will be discussed in section 4. Since situation pronouns play a crucial role in this, the split intensionality account does not lend itself to such an extension. These additional considerations thus favor the proposal advanced here over Split Intensionality.

In addition to the differences just discussed, the way scope and intensional status of DPs are connected on the split intensionality account seems problematic. Some of the predictions that the account makes in this regard are as follows:²⁸

²⁸An additional prediction is that relative clauses and their head-nouns have to be interpreted relative to the same situation. This seems problematic given the existence of so-called later-than matrix readings and seemingly parallel data in the possible-world domain (see (92) in section 5).

- DPs taking quantificational scope under two modal operators can only be interpreted relative to the situations quantified over by these operators, not relative to the situation of evaluation of the entire sentence (or a higher modal operator).
- In a case where there are two DPs in a clause embedded by an intensional operator, one of which receives a transparent interpretation and the other an opaque one, the transparent one has to take quantificational scope over the opaque one.
- Transparent interpretations should never be possible for DPs embedded in syntactic islands.

It doesn't seem like these predictions are borne out. The first one is rather difficult to assess empirically, as it involves multiple modal operators and would require quite complex and elaborate scenarios to conclusively show that the relevant readings exist. But the last two are fairly straightforward to test, and the results disconfirm the predictions. Consider the following scenario, for example:

(50) a. *Context:*

John stumbled into an event at the student union where junior faculty present a paper from their field that they take to be a real breakthrough. Since it's in the student union, and since the faculty are all very young, he mistakenly thinks that they are students. Furthermore, since some of the presentations are filled with elaborate and metaphorical technical terminology, he doesn't realize that these are simply presentations of academic papers. In particular, he mistakes the presentations of all the professors that presented (different) papers on theoretical linguistics for presentations about poems.

- b. John thinks that every student that presented a paper on theoretical linguistics is a literary scholar (because he thinks they presented a poem).

Every student in (50b) has to receive an opaque interpretation, as the individuals in question are actually professors. *A paper on theoretical linguistics*, on the other hand must be interpreted transparently, since John thinks these were presentations of poems. At the same time, however, *a paper on theoretical linguistics* takes quantificational scope below *every student*, since John is well aware that the relevant presentations had different topics (i.e., a standard *de re* interpretation would not make do, as there is no one actual paper on theoretical linguistics about which John has the relevant belief.). This is as expected, of course, since the indefinite appears in a relative clause - an island for movement (though special scope taking mechanisms sometimes allow indefinites to avoid the constraints imposed by islands). But at the same time, this shows that movement to the top of the embedded clause is not necessary for a transparent interpretation, allowing for transparently interpreted DPs to take scope under opaque ones. It also shows that transparent interpretations are possible in islands. This, of course, contradicts the last two predictions considered above, but is easily modeled in a system with situation pronouns.

Given these problems, I conclude that tying transparent interpretations to scope in any way is undesirable.²⁹ Since the proposal I've advanced also has broader empirical coverage with respect to donkey sentences, temporal interpretations of DPs, and domain restriction, it seems more successful on the whole.

²⁹Keshet (2010b) discusses further data that he argues to support a scope theory, which need to be considered from the perspective of the present proposal. I leave this to another occasion.

3.6 Interim Summary

I have laid out an intensional semantic system based on the idea that syntactically represented situation pronouns are only present in a few dedicated places. Focusing on DPs, I argued that they are introduced by certain determiners. The resulting system captures the standard data on transparent interpretations and furthermore accounts for the restrictions on their availability discussed by Percus (2000) and Keshet (2008). The choice of where in the DP situation pronouns appear was informed by considering a broader range of data, namely from temporal semantics and the literature on donkey sentences.

The system presented here has broader empirical coverage than other accounts proposed in the literature, and maintain one of the main advantages of situation pronoun theories, namely that they allow quantificational scope and intensional status to be independent from one another (at least for the most part, with the exception of wide scope opaque interpretations), contra Keshet (2010b). It is also worth noting that unlike standard accounts of transparent interpretations based on world pronouns, the situation pronouns in the present proposal have exactly the same set of interpretative options as other pronouns. In particular, they can be bound or be interpreted contextually via the assignment function. The motivation for the latter option will be corroborated further in the next section. This property is appealing conceptually. If we assume things like covert pronouns for intensional entities, it seems desirable to make these as similar as possible to overt pronouns that are used in the individual domain.

In the next section, I will spell out in detail how situation pronouns provide everything we need for a situation semantic account of domain restriction - in fact, one that is theoretically more parsimonious and empirically more adequate than its main contender, which is based on so-called *C*-variables.

4 Domain Restriction via Situations

I begin this section with a brief review of basic data on domain restriction and theoretical accounts based on a contextually supplied *C*-variable, and then go on to argue for an alternative, situation semantic account. The central arguments in favor of the latter are twofold: first, it is exclusively based on independently needed mechanisms, primarily the situation pronouns needed to account for transparent interpretations. Secondly, I show that a number of problems that *C*-variable accounts face with respect to the location of domain restriction do not arise on a situational account.

4.1 Domain Restriction with a *C*-variable

4.1.1 Domain Restriction Variables in Noun Phrases

One common approach to analyzing domain restriction is the following. Assuming an analysis of quantificational determiners as relations between sets (or properties, in an intensional semantics) (Barwise and Cooper, 1981), the set denoted by the nominal restrictor (i.e., the noun phrase that a quantificational determiner takes as its first argument) can be assumed to be conjoined with a contextually supplied set to yield a more restrictive set that serves as the domain of quantification (Westerstahl, 1984; von Stechow, 1994). One type of evidence favoring such an approach over, e.g., the alternative possibility that utterances in general

are interpreted with respect to a restricted universe of discourse, comes from examples such as the following.

- (51) Sweden is a funny place. Every tennis player looks like Björn Borg, and more men than women watch tennis on TV. But most people really dislike foreign tennis players.
(von Fintel, 1994, p. 29, ex. 20, modeled after an example from Westerstahl 1984)

The key point in the last sentence here is that *most people* is most naturally understood as *most Swedes*, while, at the same time, the universe of discourse cannot be restricted to Swedes, because we also have to interpret *foreign tennis players*. Thus, it looks like each quantificational noun phrase needs to be able to access its own ‘resource domain’, in von Fintel’s (1994) terminology. As von Fintel (1994, p. 29, footnote 18) notes, the same point had been made in the literature on incomplete descriptions even earlier, with examples such as the following:

- (52) The pig is grunting, but the pig with floppy ears is not grunting.
(Lewis, 1973, pp. 111-117)
- (53) Yesterday the dog got into a fight with a dog. The dogs were snarling at each other for half an hour, I’ll have to see to it that the dog doesn’t get near that dog again.
(McCawley, 1979)
- (54) The cook’s father is also a cook.
(Soames, 1986)

In all of these examples a definite is used in the same sentence as another noun phrase that requires the existence of a different individual fitting the same description. Therefore, the uniqueness requirement of the definite cannot be evaluated with respect to a universe of discourse that is fixed for the entire sentence.

While the examples at hand strictly speaking only require that different DPs can be interpreted relative to different domains, which could be accounted for by assuming that the context can change rapidly within a sentence (as was proposed, for example, by Kratzer, 1978; von Stechow, 1979), examples involving quantificational binding of domain restriction, such as (55), provide a strong argument in favor of syntactically represented domain restriction variables inside of DPs (von Fintel, 1994).

- (55) Everyone answered every question. (Stanley and Szabo (2000),
(after examples by von Fintel, 1994; Cooper, 1993)
- (56) Only one class was so bad that no student passed the exam. (Heim, 1991)

They thus provide a powerful argument against purely pragmatic accounts, which assume that domain restriction is not represented syntactically, as it is unclear how the effect of quantificational binding could be implemented without the presence of a syntactically represented variable that can be bound (for detailed discussion, see Stanley and Szabo, 2000).

In technical terms, the idea of representing domain restriction in the syntax can be implemented by assuming that determiners δ are indexed with a variable over properties C , which receives a value from the context via the assignment function g . This value will

be a set (or property), which is then intersected with the set (or property) denoted by the nominal restrictor:³⁰

$$(57) \quad \llbracket \delta_c \rrbracket^g = \lambda P_{\langle e,t \rangle} . \lambda Q_{\langle e,t \rangle} . \delta^* \langle P \cap g(C), Q \rangle$$

(adapted from von Fintel, 1994)

The proposal by von Fintel (1994, p. 31) for modeling quantificational binding of domain restriction variables is to assume that C can have the complex structure $f(i_1, \dots, i_n)$, where f is an n -place function variable and i_1, \dots, i_n are individual variables. In (55), f would be a (one-place) function mapping individuals to sets of questions, for example, and in (56) a (one-place) function mapping classes to sets of students. An individual variable i_x can be bound by a higher quantifier, which yields the desired effect of the domain of the lower DP covarying with the values of the higher quantifier, e.g., the students or classes quantified over.

Parallel analyses have been proposed in the literature on definites and pronouns as well, in particular to account for donkey pronouns (Cooper, 1979; Heim, 1990; Chierchia, 1992; Heim and Kratzer, 1998) and certain kinds of covarying readings of definites (Chierchia, 1995).

(58) a. Every farmer who owns a donkey beats it.

b. *it*: $[_{DP} \text{ the } [_{NP} [_{N} R_{\langle \gamma, \langle e, et \rangle} \rangle]} [_{DP} \text{ pro}_{\langle I, e \rangle}]]]$
 $g(7) = \lambda x . \lambda y . y \text{ is a donkey that } x \text{ owns}$

(In Heim and Kratzer's (1998) version of Cooper's (1979) approach)

(59) a. Every student who was given a pen and a notepad lost the pen.

b. $\llbracket \text{the pen} \rrbracket^g = \iota x . R_{\langle \gamma, \langle e, et \rangle} \rangle (y)(x) \ \& \ \text{pen}(x)$ ³¹
 $g(7) = \lambda y . \lambda x . x \text{ was given to } y$

(Chierchia, 1995, p. 223, ex. (63b))

(notation assimilated to the approach in Heim and Kratzer, 1998)

In (58a), *it* is construed as an E-type pronoun (or a D-type pronoun, following Neale's (1990) and Elbourne's (2005) terminology), and the assignment function g provides a function from people (or farmers) to the set of donkeys they own as the value for the free functional variable R . This yields the desired interpretation that each farmer beats the donkey he owns.^{32,33} Similarly, Chierchia proposes for (59a) that the definite *the pen* has its domain further restricted by a (complex) domain restriction variable, which is assigned a function from people (or students) to the set of things that they were given, which ensures that the definite receives a covarying interpretation (on which different students lost different pens, namely whichever one they were given).

³⁰The schema is adapted from von Fintel (1994, p. 31) to the λ -notation used here. δ_c stands for a quantificational determiner as a natural language expression, δ^* for the relation between sets that that determiner denotes.

³¹It's not clear that Chierchia is committed to any claims about the syntactic status of the variable R , which is why I only give the meaning he would assign to the definite description in question.

³²More precisely, that each farmer beats the unique donkey he owns. This is problematic insofar as (58a) can be true even if some farmers own more than one donkey. I won't discuss the details of this problem here.

³³See Elbourne (2005) for arguments against this type of account and in favor of a situational analysis.

4.2 Domain Restriction via Situations

A fairly wide range of authors working with different versions of situation semantics have proposed to capture (at least certain aspects of) domain restriction effects by means of the partiality provided by situations (Barwise and Perry, 1983; Berman, 1987; Kratzer, 1989; Heim, 1990; Cooper, 1993, 1995; Recanati, 1996, 2004; Percus, 2000; Elbourne, 2005; Wolter, 2006; Kratzer, 2007). The general idea is based on the fact that in a situation semantics, sentences in general and quantificational expressions in particular are not evaluated with respect to the entire world, but rather with respect to parts of the world. It seems natural, in such a framework, to assume that quantificational claims are restricted to individuals that can be found within the part of the world, or situation, that the sentence (or an individual DP) is interpreted with respect to (or within other contextually salient situations).

In the situation semantic system introduced in section 3, domain restriction in (strong) DPs is provided by the situation pronoun introduced with the determiner, which was motivated by transparent interpretations. The central question for such DPs then is what the options for interpreting their situation pronoun are. As we already saw in section 3, the standard options for interpreting pronouns are available: they can be identified with the topic situation (via the binding operator Σ adjoined at the top of the clause) or with a contextually salient situation (by receiving a value via the assignment function). Alternatively, they can be bound by a quantifier over situations (again, via Σ , adjoined below the relevant quantifier). The schematic illustration of these options is repeated below (where ‘OP’ stands for a quantifier over situations, as before).

- (42) a. ... Σ_r [... OP [_{VP} ... [[*D s_r*] NP] ...]] (s_r = topic situation)
 b. ... [... OP [_{VP} ... [[*D s_r*] NP] ...]] (s_r remains free)
- (43) ... OP [Σ_r [_{VP} ... [[*D s_r*] NP] ...]] (s_r bound by OP)

Examples for each of these options will be sketched below for quantificational DPs. While this section focuses on domain restriction with determiners, it should be clear that given that adverbial quantifiers arguably also involve quantification over situations, accounting for their domain restriction should fit into this system rather naturally as well (e.g., along the lines of von Stechow, 1994, 1995, 2004; Percus, 2000).

4.2.1 Interpreting Situation Pronouns Relative to the Topic Situation

The first possibility for interpreting the situation pronoun on a noun phrase that I will consider is that it is identified with the topic situation, i.e., the situation that the sentence is about. Kratzer (2004) discusses (60) in these terms:

- (60) Since it had snowed during the night, everyone shoveled their driveway.
 (Kratzer, 2004)

In analogy with the notion of topic times (Klein, 1994), Kratzer suggests that the quantifier *everyone* in (60) is interpreted with respect to a past topic situation. Note that, as Kratzer emphasizes, it would not be enough to interpret this sentence with respect to a past topic time - we are not talking about all the places in which it had snowed at a past time t and all the people in those places. Rather, we are talking about some specific situation in the past in which it first snowed and in which all the people in that situation later shoveled their driveway.

As I have mentioned before, there may be a good case for representing topic situations in the syntax as well, but I will not go into this issue here. Whether or not we ultimately choose to do this, it is of utmost importance to have a specific proposal for how topic situations are determined. One such proposal, building on a suggestion in [Kratzer \(2007\)](#), is spelled out in [Schwarz \(2009, Chapter 4\)](#). The basic idea is to relate topic situations to a well known framework for capturing important aspects of discourse structure, namely that based on Questions Under Discussion (QUD, [Roberts, 1996](#); [Büring, 2004](#)). More specifically, the proposal is to identify the topic situation with the situation exemplifying the proposition that is the question extension in a situation semantic implementation of [Groenendijk and Stokhof \(1984\)](#) (roughly, the minimal situation in which that proposition is true).³⁴ In the case above, the QUD could be something like *What was going on in Amherst on the morning of February 10th, 2010?* (60) then is interpreted relative to the situation that exemplifies the question extension, i.e., the minimal situation containing everything that was going on in Amherst on that morning.

The parallel example in (61) provides another illustration:

- (61) a. (possibly implicit) QUD: What did the people in the kitchen do after John told his joke?
 b. Everyone laughed.
 c. $s_{topic} \approx$ ‘The situation exemplifying what the people in the kitchen did after John told the joke’
 d. $[\Sigma_1 \text{ } [[[\textit{every } s_1] \textit{ person}] \textit{ laughed}]]$
 e. $[[\textit{(61d)}]] = \lambda s. [s \approx s_{topic} \ \& \ \forall x[\textit{person}(x)(s) \rightarrow \textit{laugh}(x)(s)]]$ ³⁵

The sentence in (61b) is understood to claim that every person present in the kitchen when John told his joke laughed. In other words, the situation variable introduced with the quantificational determiner *every* is identified with the topic situation, which includes the people in it at the relevant time. In order to derive this interpretation, the logical form of the sentence will contain a Σ -operator that is coindexed with the situation argument on the determiner. This ensures that the quantificational noun phrase *every person* is interpreted relative to the same situation as the the verb *laughed*. What a speaker claims when uttering (61b) in the provided context, according to our theory, is the proposition in (61e). This proposition consists of every situation that is a counterpart of the topic situation and in which every individual contained in it laughs.

4.2.2 Interpreting Situation Pronouns Relative to a Contextually Salient Situation

Evaluating quantifiers relative to the topic situation in a sense corresponds to a global mechanism of domain restriction at the level of the entire sentence. As we saw in our discussion above, we need more flexibility than that to account for cases where several quantifiers within one sentence have to be interpreted relative to distinct domains. The example in (62), due to [Soames \(1986\)](#) (who provides it as a variation of an example by [Barwise and Perry \(1983\)](#)), is a case in point.

- (62) Everyone is asleep and is being monitored by a research assistant.

³⁴Though the proposal is compatible with other theories of questions as well.

³⁵This meaning is based on the assumption that the topic situation is syntactically represented. ‘ \approx ’ here stands for the counterpart relation. See [Schwarz \(2009\)](#) for details.

As Kratzer (2007) discusses (in response to Soames’ criticism of situation semantic accounts of domain restriction that only make use of (the equivalent of our) topic situations), this sentence requires us to interpret the situation pronoun on the quantifier *everyone* relative to a contextually supplied situation to prevent the implausible interpretation that the research assistants doing the monitoring are asleep as well. The interpretation of (62), assuming a simplified meaning for *every*, would then be as follows:

- (63) a. $\llbracket[\textit{every } s_r]\textit{one}\rrbracket[\llbracket\textit{is asleep}\rrbracket[\textit{and being monitored by an RA}]]$
 b. $\llbracket(63a)\rrbracket^g = \lambda s. [\forall x[\textit{person}(x)(g(r)) \rightarrow$
 $\textit{asleep}(x)(s) \ \& \ \exists y [\textit{RA}(y)(s) \ \& \ \textit{monitoring}(y)(x)(s)]]]$
 (adapted to our system from Kratzer, 2007)

Crucially, the situation pronoun that comes with *everyone* is assigned a value by the assignment function here, i.e., it is interpreted relative to a contextually supplied situation, namely one that contains all and only the research subjects at hand. Another example illustrating the need for interpreting situation pronouns relative to contextually supplied situations comes from Cooper (1995).

- (64) a. Context: Suppose that we have a university department whose members consist of linguists and philosophers. In one particular year two people are coming up for tenure, a linguist and a philosopher, but the department is only allowed to recommend one of them. To the shame of this department...
 b. *Every linguist voted for the linguist and every philosopher for the philosopher.*
 (Cooper, 1995, ex. (19))

This example shows that the universal DPs and the definites have to be interpreted with respect to different situations. Otherwise, as Cooper puts it, the sentence would ‘describe a situation in which the department had exactly two members, a linguist and a philosopher, who voted for themselves’ (Cooper, 1995), which clearly doesn’t match our intuitive understanding of the sentence. The definites then could plausibly be interpreted relative to a contextually salient situation consisting of the people currently up for tenure, and the universal quantifier relative to the contextually salient situation consisting of the relevant department of linguistics and philosophy.

The question of what makes a situation available (and salient) in a context is equally important as the question of how topic situations are determined. In our analysis, the issue is completely analogous to the question of what individual a free pronoun can pick out, since in both cases, the assignment function g assigns a value to an index. One possibility, considered by Schwarz (2009, Chapter 4), is that situations exemplifying other QUDs from the ongoing discourse provide a class of contextually salient situations. I leave further exploration of this issue to future research, but note that it seems perfectly feasible to come up with a restrictive theory about this.

4.2.3 Covarying Interpretations of Quantifier Domains

One strength of the C -variable account is that it is able to capture cases where the C -variable received a bound interpretation, i.e., where the domain of a lower quantifier covaried with another quantifier higher up. In order to capture this option in a situation semantic account of domain restriction, we need to allow the higher quantifier to somehow access the restrictor argument of the lower quantifier. We need two ingredients to achieve this. First,

quantificational determiners need to introduce their own quantification over situations. This is independently motivated, e.g., by donkey sentences. Secondly, Kratzer (2004) proposes that we can use so-called ‘matching functions’ (Rothstein, 1995) to capture the effect of covarying domains. Matching functions are independently needed as well. Rothstein (1995) introduces them to account for matching effects with adverbial quantification, as in the following example.

(65) Every time the bell rings, Mary opens the door.

(Rothstein, 1995)

Crucially, requires there to be at least as many door-opening events as there are door-bell ringing events. This is not easy to capture, as the initially plausible analysis along the lines of the paraphrase ‘For every bell-ringing, there is a door-opening by Mary’ allows there to be just one door-opening with which all of the bell-rings are said to be associated. But for (4.2.3) to be true, Mary must have opened the door at least once for each bell-ringing, so there must be different door-openings for the different bell-rings.

Rothstein proposes an analysis based on a matching function in the nuclear scope (which she takes to be introduced by a null preposition that comes with the adverbial phrase). The final interpretation, couched in an event semantics, that she assigns to (4.2.3) is the following:

$$(66) \quad \forall e[\text{RING}(e) \ \& \ Th(e) = b \rightarrow \exists e'[\text{OPEN}(e') \ \& \ Ag(e') = m \ \& \ Th(e') = d \ \& \ M(e') = e]]$$

The sentence thus quantifies over bell-ringing events and says that there is a door-opening event for each bell-ringing event, and furthermore that each door-opening event is mapped onto the bell-ringing event in question by the matching function. The last part ensures that there are at least as many door-openings as there are bell-rings, since M is a function.

Kratzer (2004) adapts Rothstein’s analysis and proposes that universal quantifiers themselves come with a matching function. (67) is a version of her lexical entry for *every*, adapted to our system.³⁶

$$(67) \quad \llbracket \text{every} \rrbracket = \lambda s_r. \lambda P. \lambda Q \lambda s. \forall x [P(x)(s_r) \rightarrow \exists s_1 [s_1 \leq s \ \& \ M(s_1) = x \ \& \ Q(x)(s_1)]]$$

A sentence with two universal quantifiers, where the domain of the lower quantifier covaries with the higher one, is then interpreted as follows:³⁷

$$(68) \quad \begin{array}{l} \text{a. Everyone finished every job.} \\ \text{b. } \lambda s. \forall x [\text{person}(x)(s) \rightarrow \exists s_1 [s_1 \leq s \ \& \ M(s_1) = x \ \& \ \forall y [\text{job}(y)(s_1) \rightarrow \text{finished}(y)(x)(s_1)]]] \end{array}$$

(adapted from Kratzer, 2004)

In order to derive this interpretation in our system, the situation pronoun on the lower *every* has to be bound by a Σ adjoined below *everyone*. This requires the type-variant of Σ in (69), as it has to combine with an XP of type $\langle e, st \rangle$ in such cases. The structure of (68) from which the interpretation above is derived is provided in (70).

$$(69) \quad \llbracket [\Sigma_n \text{ XP}]^g \rrbracket = \lambda x. \lambda s. \llbracket \text{XP} \rrbracket^{g[s_n \rightarrow s]}(x)(s) \quad \text{Büring (2004), for XPs of type } \langle e, st \rangle$$

³⁶As before, I’m simplifying the meaning of *every* to focus on the issues at hand.

³⁷Presumably, the lower *every* introduces a matching function of its own as well, but in cases where it doesn’t restrict the interpretation in any way, I will omit it. I also omit the existential quantification over situations in the nuclear scope of the lower *every* here.

(70) $[[[Every\ s_r]\ one]\ [\Sigma_{r'}\ [finished\ [[every\ s_{r'}]\ job]]]]$.

On the analysis in (68), the sentence says that for every person in s there is a situation s_I in which he or she finished every job in s_I . Furthermore, these s_I -situations have to be different ones for each person x in s , because the matching function has to map s_I onto x . Since M is a function, it can only map each of the s_I -situations to exactly one person, thus there has to be a different situation of the relevant kind for every person.

Note that there is an interesting difference between the effect of the matching function here and in the cases discussed by Rothstein. While (4.2.3) requires there to be a different door-opening for each bell-ringing, (68) does not require an interpretation where different people have different jobs to finish. They could all have the same set of jobs, or partially overlapping ones, or completely different ones.³⁸ This is not prevented by the requirement introduced by the matching function that there be different situations in which each person finished every job, because the situations will minimally differ, in any case, in terms of what individuals must be part of them (in order to finish a job in s , you have to be part of s).

How exactly the domain for each of the cases quantified over is determined therefore is entirely dependent on what the matching function stands for. Rothstein (1995) assumes it is provided by the context, i.e., that M is a contextually supplied variable. For (68), it might be the function that assigns jobs to people, for example. More specifically, to account for the possibility of partial or total overlap of jobs for various people, it will have to be something like the following:

(71) $M(s) = x$ iff s is a situation that contains every job assigned to x as well as x , but no other relevant individual y .

To render the appropriate interpretation of (68), s has to contain every job assigned to x . It also has to contain x , in case there is another individual that has the same set of jobs. Since M is a function, it has to assign exactly one value to each element in its domain. If two individuals have the same jobs, we can only map the situation containing these jobs to one of them, so we have to specify as part of the function that x is part of the situation. For the same reason, we have to make sure that no other relevant individuals are in the situation, where ‘other relevant individual’ means another element in the range of M .

It is worth noting that, as Cooper (1995) points out, a situational account of covarying quantifier domains may be able to account for cases that cannot straightforwardly be captured on a C -variable approach to domain restriction. He offers the example in (72).

(72) Whatever John does, most people turn up late for the experiment.
(Cooper, 1995, ex. (25c))

While a full analysis of this example goes beyond the present discussion, it is plausible to see it as involving quantification over situations that have a contextually supported property, e.g., situations in which John tries different methods for scheduling participants for his experiment. The quantifier *most people* is then interpreted relative to these situations,

³⁸Different interpretations may be more plausible depending on the choice of the VP, of course:

- (i) Everyone looked at every picture.
- (ii) Everyone ate every cookie.

In (i), it may be quite natural to understand everyone to have seen the same set of pictures, whereas in (ii), it more or less has to be a different set of cookies for each person.

i.e., the situation pronoun on *most* is quantificationally bound. A *C*-variable account, on the other hand, would seem to face some difficulties in finding an appropriate analysis of *C* that would allow for the relevant covarying interpretation.³⁹

To sum up, introducing matching functions, which are independently needed to account for matching effects with adverbial quantification (Rothstein, 1995), as well as quantification over situations with quantificational determiners (which is also independently motivated), provides us with a method for modeling covarying domains in a situation semantic approach to domain restriction.

4.2.4 Summary

In this section, I laid out the framework for capturing domain restriction in the type of situation semantics that was introduced in the previous section. At the core of the proposal are the various options for interpreting situation pronouns inside of noun phrases: they can be identified with the topic situation (by being bound below *topic*) or a contextually salient situation (by receiving a value via the assignment function), or be quantificationally bound by a quantifier over situations.

4.3 Comparison between *C*-variable and situational accounts

We now have seen how *C*-variable accounts and situational accounts deal with the basic data concerning domain restriction. In terms of empirical coverage, they more or less fare the same up to this point, though the situational account is slightly more articulated in that it distinguishes between cases where the situation relative to which a given DP is evaluated relative to the topic situation and ones where it receives its value from the assignment function. In this section, I now move on to issues where the two accounts come apart. First, I'll discuss a conceptual advantage of a situational account in terms of theoretical parsimony. The second point concerns the precise location of the variable that brings about domain restriction. The third relates to a more general issue in terms of the predictive power of the two accounts, in particular with respect to problems of overgeneration for the *C*-variable account.

4.3.1 The Conceptual Advantage

In beginning this comparison, I'd like to highlight what I take to be a fundamental conceptual advantage of capturing domain restriction effects in terms of situations. Situation semantics is motivated by its capacity for accounting for various phenomena in natural language that are independent of domain restriction (see Kratzer, 2007, for a recent overview).⁴⁰ Once we adopt a situation semantics, domain restriction effects due to the partiality of situations come for free. Put differently, we have no choice but to worry about what situations expressions are interpreted in, and once we do so, we better make sure that our theory is compatible with empirical facts about domain restriction. While it is inevitable for the partiality of situations to give rise to domain restriction effects, however, it is not certain from the outset that all such effects are due to situations. But working in a situation semantics, the general research strategy should be to explore exactly what domain restriction effects

³⁹Unless, perhaps, if we allow *C*-variables to denote functions with situation arguments as well, although that would seem to run into the danger of yielding a highly unrestrictive theory.

⁴⁰Given that, at least on the view I would take, events are simply a special type of situation, we can include event semantics and its motivations here as well.

we can capture with the independently motivated mechanisms of our semantic theory before introducing any additional machinery.⁴¹ Considering the data above, a theory based on situation pronouns (paired with other independently needed mechanisms) suffices to account for domain restriction phenomena.

4.3.2 The Problem of the Location of the *C*-variable

One important question that arises for *C*-variable accounts is where the domain restriction variable is introduced into the logical form. One view is that it is introduced with the quantificational determiner (Westerstahl, 1984; von Stechow, 1994; Martí, 2003). Another possibility is that it is introduced with the nominal restrictor. Stanley and Szabo (2000) and Stanley (2002) provide a number of arguments in favor of the latter view. More specifically, they propose that the domain restriction variable is introduced with the head noun of the restrictor clause.

The first argument, presented by Stanley and Szabo (2000), involves different readings of cross-sentential anaphora. Consider the following sentence, uttered in a conversation about a certain village.

- (73) Most people regularly scream. They are crazy. (Stanley and Szabo, 2000)
 Reading 1: The people in the village are crazy.
 Reading 2: The people in the village that regularly scream are crazy.

Assuming that, ‘[i]deally, one would wish to say that cross-sentential anaphora of this sort requires antecedents that are constituents (nodes) of a preceding logical form,’⁴² placing the domain restriction on the noun (*Most [people_C]*) allows a straightforward derivation of reading 1, since the pronoun *they* simply can have *people_C* as its antecedent (Stanley and Szabo, 2000, p. 257).⁴³ If the domain restriction variable were on the determiner (*Most_C [people]*), there would be no antecedent node denoting the set of people in the village.

The second reading can also be captured if the domain restriction variable is located on the noun, e.g., if one assumes something like Neale’s (1990) rule for interpreting D-type pronouns.

- (74) If *x* is a pronoun that is anaphoric on, but not *c*-commanded by a non-maximal quantifier “[D*x*:F*x*]” that occurs in an antecedent clause “[D*x*:F*x*](G*x*)”, then *x* is interpreted as “[the *x*: F*x* & G*x*].”
 (Neale, 1990, p. 266, rule (P5b))

Reading 2 can then be captured if we assume that the domain restriction variable is on the noun, as the application of Neale’s rule will interpret *they* as *the people that live in the village and scream*. If the domain restriction variable were on the determiner, the only re-constructable reading would be *the people that scream*, thus falsely predicting that (73) makes a claim about all screaming people in the world (Stanley and Szabo, 2000).

⁴¹As Kratzer (2007) notes, domain restriction effects as a whole may come about from a number of mixed sources (including purely pragmatic ones), but still, it is preferable to have general, independently needed mechanisms for as many of those sources as possible.

⁴²It is unclear whether such a requirement can be upheld in general, given the existence of so-called ‘complement anaphora’, as in *Few congressmen admire Kennedy. They think he’s incompetent* (Moxey and Sanford, 1993; Nouwen, 2003), in which, in contrast with Evans’s (1980) original version of the sentence (. . . *They are very junior*), the pronoun *they* picks out the ‘non-admirers’.

⁴³Stanley (2002) emphasizes that, on their account, *C* does not occupy a node of its own.

The second argument, brought fourth by Stanley (2002, attributed to Delia Graff Fara, p.c.), involves noun phrases that contain a superlative adjective.

- (75) a. The tallest person is nice. (Stanley, 2002)
 b. $g(C) = \{x|x \text{ is a Cornell student}\}$
 c. $\llbracket \textit{tallest} \rrbracket = \lambda P.\{y|y \text{ is the tallest of all } x \in P\}$
 d. The tallest person $_{\{x|x \text{ is a Cornell student}\}}$
 \approx ‘The unique individual x such that x is the tallest person of all Cornell students’
 e. The $_{\{x|x \text{ is a Cornell student}\}}$ tallest person
 \approx ‘The unique individual x such that x is the tallest person and x is a Cornell student’

Assuming (with Stanley) that the domain is restricted to students of Cornell University (75b), and that the superlative adjective *tallest* takes the head noun as its argument and returns a set consisting of the tallest individual in the set denoted by the head noun (75c), placing the domain restriction variable on the noun yields the intuitively correct result that we are making a claim about the tallest Cornell student (75d). If the domain restriction variable were on the determiner, on the other hand, we would end up trying to intersect the set containing the tallest person in the world with the set of Cornell students (75e). This, in turn, would yield the strange result that this sentence could only be truthfully (and felicitously, assuming a presuppositional view) uttered (given the assumed domain restriction) if the tallest person in the world happened to be a student at Cornell.⁴⁴

A third point that Stanley (2002) presents in favor of putting the domain restriction variable on the noun is connected to the issue of comparison classes for comparative adjectives.

- (76) Smith is a remarkable violinist. (Stanley, 2002)

Kamp (1975, p. 152) notes that ‘the noun is not always the determining factor’ in construing the comparison class for an adjective like *remarkable*. An utterance of (76) may be true if talking about Smith’s violin-playing at a dinner party, but not true if talking about a formal concert setting (Kamp, 1975, pp. 152-153). Stanley argues that this can be captured rather nicely if we assume that the domain restriction variable is located on the noun. When talking about Smith’s dinner-party performance, the domain variable restricts the noun *violinist* to, say, people that have played on similar occasions, and it does the same if talking about a formal concert setting. Naturally, someone that counts as a remarkable violinist among the first group of people need not count as one among the second. Thus, the context dependency of *remarkable* is captured because it ends up combining with different sets of violinists, depending on what the value of the domain restriction variable on the noun is.

While these arguments seem to make a fairly strong case for placing the domain restriction variable on the noun, this approach also faces some problems.⁴⁵ First, it makes false predictions for non-intersective adjectives such as *fake* and *alleged* (Breheny, 2003).

⁴⁴As Stanley himself notes in a footnote, whether or not this argument goes through may depend on the exact analysis of superlatives that we adopt, since many current analyses in linguistics involve movement of the morpheme *-est* to a higher position.

⁴⁵My discussion of these problems follows the one in (Kratzer, 2004) rather closely.

- (77) a. Every fake philosopher_C is from Idaho.
 b. $g(C) = \{x|x \text{ is American}\}$
 c. Every fake American philosopher is from Idaho.

If the domain restriction variable is on the noun and the context assigns the set of Americans to C , then (77a) should be equivalent to (77c). This is not the case, however. Consider the case of a genuine European philosopher who pretends to be American: the existence of such a person would count as a counter-example to (77c), but not to (77a) (Breheny, 2003). We thus have an argument against putting the C -variable on the noun, which together with the previous arguments *for* putting it on the noun creates what I will call ‘the location problem’ for C -variable accounts.

One possible response for proponents of placing C -variables on nouns would be to move to an intensional perspective. C -variables then would plausibly introduce intensional properties (type $\langle e, st \rangle$ or $\langle s, et \rangle$). However, in order to account for the fact that an adjective like *fake* cannot target the intensional argument of the property introduced by C , one would further have to claim that C -variables combine with their own situation pronoun, and that this pronoun cannot be bound by *fake* in contrast to the situation argument on the overt noun. This, of course, is contrary to what we found for other modifiers above. Keshet’s (2008) Intersective Predicate Generalization precisely stated that whenever two predicates can be interpreted intersectively, they have to be evaluated relative to the same situation (or same time and world). Semantically, C -variables would be completely equivalent to overt modifiers, so it would take some serious explaining to account for the fact that they differ from other modifiers in this respect.⁴⁶ Unless such an explanation can be found, the location problem remains a serious challenge for C -variable accounts.

Another possible reaction for C -variable proponents would be to point out that the *fake*-data still is, in principle, compatible with placing the domain restriction variable on an extended nominal projection or on the determiner. In light of the location problem one then might want to pursue the possibility that the domain restriction variable is introduced at the level of the NP. This would be compatible with the anaphora data above, and it would likely also be compatible with accounts of the superlative that see it as quantifying over degrees, and which allow (or even require) it to take scope above the NP. Finally, it would ensure that the C -variable is outside of the scope of adjectives like *fake*, and thus has the potential to resolve the location problem.

However, occurrences of the C -variable would still be tied to NPs, which is problematic, as was pointed out by Martí (2003), since we also find domain restriction with other quantificational expressions, such as adverbials (e.g., *always*). If the C -variable were to be found exclusively in NPs, then it is unclear how domain restriction with adverbial quantifiers, which do not take a noun phrase argument in the first place, can be captured in a parallel way. Additional mechanism for these (and probably other quantificational expressions) would be needed, which seems undesirable, given that the types of effects we find are entirely parallel to those found with quantificational DPs (see, for example, von Stechow, 1994; Martí, 2003). If we assume, on the other hand, that the domain restriction variable is introduced with the quantificational expression itself (i.e., on D, in the case of quantificational noun phrases), we can provide an entirely parallel account for a wide range of quantificational expressions. But that is, of course, incompatible with the arguments considered above for placing the C -variable in the NP, so the location problem seems to persist.

⁴⁶Interestingly, the behavior of C -variables on this line of thought is essentially parallel to that of relative clauses. See section 5.

In summary, we currently have a number of good arguments supporting conflicting conclusions about where in the structure domain restriction variables are introduced. Unless we can debunk one set of these arguments, the outlook for this type of approach is not very promising.⁴⁷

4.3.3 The Location of Situational Domain Restriction

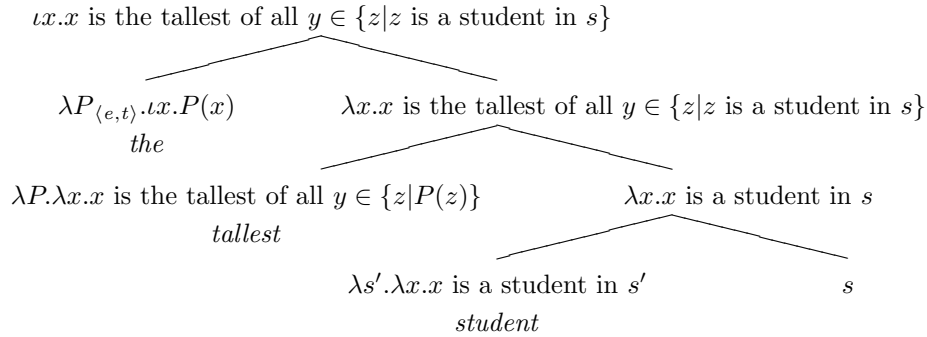
In light of the problems with respect to the location of the C -variable that we just encountered, we have to investigate whether a situation semantic approach to domain restriction faces parallel issues. In the following, I will show for each of the relevant arguments that the issue does not arise for the situational approach developed here.

Superlative Adjectives I have argued in section 3 that situation pronouns are introduced at the level of the DP. Stanley (2002) used examples involving superlative adjectives to argue against introducing the C -variable with the determiner. Let us consider, then, whether the location of situation pronouns bears on the interpretation of the relevant examples. The lexical entries for the different options to be considered naturally will have to differ for these cases, but the variations are straightforward.

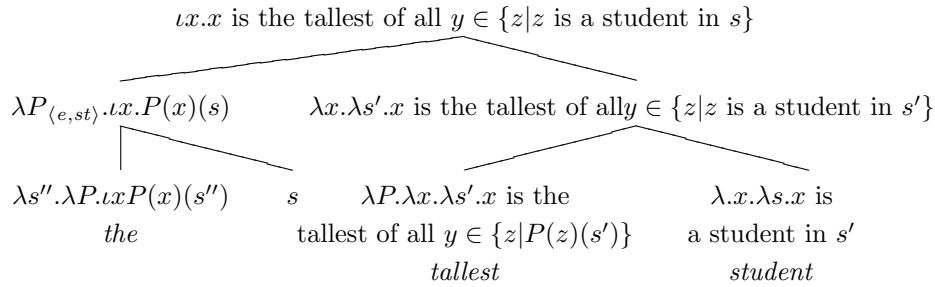
The calculations below for *the tallest student* show that the denotation of the DP as a whole comes out the same, no matter whether we introduce the situation pronoun with the determiner, the noun, or the NP. For the sake of argument, I'm assuming the same, simple denotation for *tallest* as Stanley (2002). A more compositional analysis of superlatives that involves movement of *-est* to a higher position may render the argument without any force for the C -variable in the first place (as Stanley himself acknowledges), but even if we assume a simple meaning that applies low in the noun phrase, the position of the situation pronoun does not matter.

⁴⁷Kratzer (2004) presents further problems, including a very general one for approaches using this type of domain restriction variable. The problem is that, given the way we have implemented the domain restriction variable approach, via a free variable that typically receives a value via the assignment function, just like regular pronouns do, we would expect there to be anaphoric uses of this variable, just as we find them with pronouns. However, Kratzer (2004) shows that domain restrictions variables do not seem to be able to pick up antecedents anaphorically in the way we would expect.

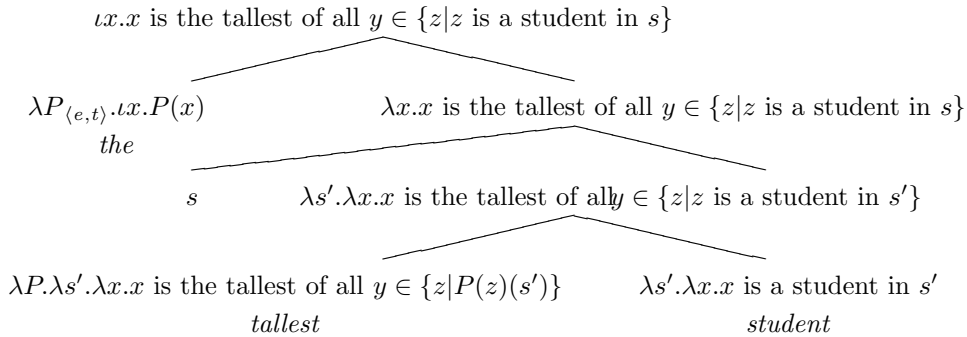
(78) Situation Pronoun on noun:



(79) Situation Pronoun on D:



(80) Situation Pronoun on NP



Superlative adjectives then do not place any restrictions on where inside of DPs we should introduce the situation pronoun.

Comparison Classes The second argument to consider is that of comparative adjectives and the effect of domain restriction on their comparison class. Recall that (76) can be uttered truly relative to Smith's dinner party performance but at the same time be false relative to his performance at Carnegie Hall, the idea being that in those two cases we are comparing him to other violinists that have played in the same place.

(76) Smith is a remarkable violinist. (Stanley, 2002)

situation in which the set of pianists is identical to the set of violinists, being a remarkable violinist is different from being a remarkable pianist, which could not be captured if *remarkable* could only operate on sets of individuals, rather than the respective properties. From the perspective of a situation semantic account, putting the resource situation pronoun on the noun itself, to keep the parallel with Stanley and Szabo’s (2000) approach, therefore is not feasible to begin with, because on that analysis, all that *remarkable* can access is a set of individuals. But if the situation pronoun is introduced by the determiner or at the level of the NP, the adjective combines with a property, which gives us the desired interpretation.

In case the DP in question turned out to be a weak one and thus contains no situation pronoun at all, then the domain restriction effect would have to come about via the topic situation. This seems a plausible option as well, but I will not spell out the details of this possibility, as the central point for our present purposes is that adjectives like *remarkable* provide no argument for placing the situation pronoun on the noun. In fact, they provide one against putting it there.

NP Anaphora The final point that we considered as an argument in favor of placing the *C*-variable on the noun, brought forth by Stanley and Szabo (2000), involved NP Anaphora in sentences like the following (assumed to be uttered in a conversation about a certain village).

(84) Most people regularly scream. They are crazy.

The crucial point was that the pronoun in the second sentence can be understood to pick out all the people in the domain we are talking about (e.g., those in a certain village), or the regular screamers amongst these people. Stanley and Szabo (2000) argue that this can be easily captured if the *C*-variable is placed on the noun, as the pronoun then can relate back to the meaning of a preceding terminal node (they assume that the domain restriction variable is part of the nominal node).

What does this argument look like from a situational perspective? I believe that, once again, it does not provide any restrictions on where in the noun phrase the situation argument should be introduced. Assuming the pronoun is a D-type pronominal description, its meaning will be something like $\iota x.\text{people}(x)(s)$,⁵⁰ no matter whether the situation pronoun is introduced with the noun or the determiner.

As far as the question of accounting for the ambiguity is concerned, there may be several options. Either we come up with a plausible story that specifies how the noun phrase is evaluated with respect to different situations in the two cases (e.g., the topic situation construed as the village that we are talking about, or the sum of subsituations in which screaming takes place), or we integrate some additional non-situational content into the definite description to ensure the appropriate anaphoric interpretation (e.g., by means of an anaphorically bound individual index; see Schwarz, 2009, Chapter 6). While accounting for anaphoric relations purely in terms of situations is no simple feat (and maybe isn’t even the right approach in general), what matters foremost for our current discussion is that there is no argument with respect to the location of situation pronouns based on these types of NP anaphora.

Intensional Adjectives Turning next to intensional adjectives like *fake* and *alleged*, the point made with respect to the *C*-variable in section 4.3.2 carries over to situational domain

⁵⁰Where the ι -operator gets a suitable maximality interpretation for the plural noun.

restriction: situation pronouns can't be on the noun itself if we want to account for the interpretation of the relevant noun phrases.

(85) the fake philosopher

The reason is slightly different from the situational perspective, however, and, in fact, completely parallel to what we saw for *remarkable* above. *Fake* is an intensional adjective and has to combine with a property, not a set. If we put a situation pronoun on the noun before it combines with the adjective, then it will only provide a set for the latter to manipulate.⁵¹ As was the case for *remarkable*, it does not matter, though, whether we introduce the situation pronoun with the determiner or at the level of the NP.

Let us summarize our findings: Superlatives and NP anaphora do not seem to provide any argument for where to put situation pronouns. Adjectives like *remarkable* and *fake* provide evidence against putting situation pronouns on the noun, but are compatible with putting it on the noun phrase or the determiner. The location problem thus does not arise in a situational approach to domain restriction based on a situation pronoun inside of DPs. Moreover, the relevant data are consistent with the proposal of introducing situation pronouns as arguments of determiners put fourth in section 3.

4.3.4 A Problem of Overgeneration

Another problem that arises for *C*-variable accounts is one of overgeneration. Chierchia (1995) proposes that functional *C*-variables are responsible for bridging interpretations of definite descriptions, such as the following:

- (86) a. Every book on this shelf has been signed by the author.
 b. $\llbracket \text{the author} \rrbracket = \iota x. [\text{author}(x) \ \& \ R(x)(y)]$
 c. $g(R) = \lambda x. \lambda y. y \text{ wrote } x$

The author here can easily receive a covarying interpretation, according to which it holds for every book that its author signed it. Chierchia proposes to capture this by making use of a relational variant of a *C*-variable, one of whose individual argument is bound by the higher quantifier *every book*. While this adequately captures the interpretation of this sentence, it does not relate the availability of the covarying interpretation to the fact that *author* is a relational noun. However, this seems to be of crucial importance. Compare (86a) to the variant in (87a), where *author* is replaced by the highly similar but non-relational noun *novelist*.⁵²

- (87) a. #Every book on this shelf has been signed by the novelist.
 b. $\llbracket \text{the novelist} \rrbracket = \iota x. [\text{novelist}(x) \ \& \ R(x)(y)]$
 c. $g(R) = \lambda x. \lambda y. y \text{ wrote } x$

⁵¹In principle, the option of introducing a situation pronoun and a λ -abstractor binding this pronoun in the scope of *fake* also exists. See section 3 for discussion of why this won't provide a general remedy for all of the issues considered in this article.

⁵²The best and only formal test for whether or not a noun is relational that I know of is the availability of *of*-possessives (Barker, 1995):

- i. the author of the book
- ii. *the novelist of the book

The relevant covarying interpretation is not available for (87a) (of course, the sentence is fine on a referential interpretation of the definite). This is unexpected on Chierchia’s account, since the same value for the *C*-variable should be available and salient, given the similarity of the nouns. *C*-variable accounts thus face an issue of overgeneration. The availability of certain readings that a *C*-variable account would capture via domain restriction depends on lexical properties of the noun involved, which is unexpected on such an account.

How do situation-based accounts fare in light of this data? First, it does not seem feasible *prima facie* to attribute the covarying interpretation in (86a) to situational domain restriction, at least not in general. The topic situation and its parts that we are quantifying over will typically not include the authors of the books that we are talking about. And even if it did, we’d need to ensure that there is a systematic way of getting from minimal book situations to supersituations that contain the right author and no others.

A more promising approach then is to make use of the relationality of nouns like *author* to account for the covarying interpretation in (86a). One possible way of doing this is to assume that the implicit relatum argument of a relational noun can be bound directly by a quantifier (i.e., that the NP implicitly has the form *the author of i*, where *i* gets bound by *every book*; see Schwarz, 2009, Chapter 6). This accounts directly for the fact that a non-relational noun like *novelist* lacks the covarying interpretation.

Note that the contrast between the relational and non-relational nouns disappears in sufficiently rich contrasts, which ensure, in one way or another, that we can interpret *the author/novelist* relative to a situation that contains a unique author/novelist. An example of such a context is given in (88).

- (88) a. *Context:* We’re at a special book fair, where authors/novelists promote their own books. Each author/novelist has his own book stand with his latest book on display, and stands behind the book stand himself.
 b. At every bookstand at which Hans read the blurb of the book, he was drawn into a conversation by the author/novelist.

This can be captured rather naturally in our framework, as there is a mechanism in place to handle contextually salient mappings, namely the matching function introduced by *every*. Such a function then can ensure that bookstands and authors are matched in the nuclear scope in the present context. In that case, *author* would have to be type-shifted, e.g. by something like the following type-shifter:

$$(89) \quad [\Pi_w] = \lambda R.\lambda x.\lambda s.\exists y [R(y)(x)(w_s) \ \& \ x \leq s]$$

With this type-shifter, *the author* picks out the unique person that is part of the situation *s* that the definite is interpreted in (which has to fit the requirements of the matching function), and which stands in the author-relation to something in the world of *s* (w_s). On this interpretation, the connection between the book at the bookstand and the author is only encoded indirectly, by means of the matching function. The non-relational noun *novelist* can receive a covarying interpretation in exactly the same way via the matching function made salient by the present context.

Much more needs to be said about the interaction of domain restriction and relational nouns, and the extent of the role of contextual support for the availability of bridging interpretations of definites (in a broad sense) is an important issue that I hope to explore in future work (see also Schwarz, 2009, for further discussion of this issue, in particular with respect to how this data relates to different types of definite articles.). For present

purposes, it suffices to show that there is a promising approach to capturing contrasts such as the one between (86a) and (87a) in a situation-based analysis of domain restriction, while a C -variable account that allows for functional variants of C runs into a problem of overgeneration. Since it appeals to the context for the basic case in (86a), the contrast in the need for contextual support with the non-relational variant with *novelist* remains unexplained.

4.3.5 Summary

I have presented three sets of arguments that favor a situation-based approach to domain restriction over C -variable approaches. The first was conceptual in nature. All of the theoretical machinery involved in accounting for domain restriction based on situation pronouns is independently needed and motivated. Since it also provides an empirically adequate account of a wide range of domain restriction phenomena, the introduction of additional mechanisms, such as ones involving a C -variable, would seem redundant at best. Secondly, I showed that C -variable accounts face a problem once we start to think seriously about where in the structure these variables are represented, as the data we considered yielded conflicting evidence in this regard. The data does not pose any problems for situational accounts, on the other hand. Finally, I presented data involving a contrast between relational and non-relational nouns, which is surprising from the perspective of C -variable accounts. Situational accounts, on the other hand, provide a more promising possibility for analyzing this data. Taken together, these arguments strongly favor an approach to domain restriction based on situation pronouns within a system like the one developed here to account for transparent interpretations and their distribution.

5 Conclusion and Further Issues

5.1 Taking Stock

This paper has argued that syntactically represented situation pronouns in DPs are introduced as arguments of (certain) determiners. The resulting semantic system allows for a unified account of transparent interpretations (including their distributional restrictions) and domain restriction based on these situation pronouns. It avoids the need for a binding theory and the notion of situation economy (Percus, 2000; Keshet, 2008, 2010a) while yielding broader empirical coverage than previous approaches. It also makes better predictions than Keshet's (2010b) Split Intensionality theory in that it does not tie intensional status and scope together. And unlike that theory (and other theories placing world or situation pronouns inside of the NP), it is compatible with situation semantic accounts of donkey anaphora and the temporal phenomena from Kusumoto (2005). With respect to domain restriction, the account has both conceptual and empirical advantages over C -variable based accounts. It is theoretically more parsimonious in that domain restriction effects are captured by exclusively using mechanisms that are independently motivated (chiefly situation pronouns and matching functions). Furthermore, it does not face the location problem of C -variable theories, and allows relational nouns to play a special role in bridging uses of definite descriptions.

Inevitably, various issues remain to be investigated more closely in order to evaluate the merits of this theory more comprehensively. I turn to some of these in the remainder of this section.

5.2 More on the Weak/Strong distinction

My account of Keshet's (2008) Generalization Z, which essentially says that only strong DPs can have transparent interpretations, was to say that only strong DPs take a situation pronoun as an argument. Since determiners that can appear in weak DPs allow transparent interpretations of their NP-predicate in contexts that don't require a weak DP, I have to assume that these determiners are ambiguous, and - in effect - can be either weak or strong. In my account, this difference is reflected in whether or not they take a situation pronoun as an argument. This would seem to give rise to the question of why only the weak determiners display this ambiguity, or, in other words, why a strong determiner like *every* does not have a variant without a situation pronoun.⁵³

There are several levels on which one can approach this issue from the perspective of the present account. First, it is, in principle, an open question whether the presence or absence of a situation pronoun alone is taken to be a sufficient characterization of the difference between weak and strong DPs. Additional aspects, such as the presuppositionality of the determiner in question might well be in play. The lack of transparent interpretations for weak DPs then could be accounted for by making it a necessary, rather than a sufficient condition that a DP in, say, the existential *there*-construction cannot contain a situation pronoun. Perhaps this could indeed be tied to the required lack of presuppositionality of DPs in this context.

Another possible approach would be to follow Landman (2004), as suggested by Keshet (2010a), and assume that weak DPs are not quantificational at all, but rather have a predicative meaning. The *some* in *There are some cookies on the table* then would be what Landman calls an adjectival determiner. When *some* occurs in a strong DP, an existential closure operator turns the predicate into a generalized quantifier (Partee, 1986; Landman, 2004). The presence of a situation pronoun then could be tied to the presence of a quantifier. A further hypothesis worth exploring in this regard would be to consider Matthewson's (2001) proposal that all quantificational noun phrases contain a possibly covert definite determiner. From this perspective, the presence of a situation pronoun in such DPs could be linked to the definite determiner, which in turn could be crucial for the presuppositionality of the DP.

Another issue arising from the claim that weak DPs do not contain a situation pronoun is that these DPs are expected to be more limited in terms of their domain restriction options. In the system presented in section 3, DPs without a situation pronoun give rise to the equivalent of locally bound interpretations of such a pronoun. In simple declarative sentences without a modal, this means that they have to be interpreted relative to the topic situation.⁵⁴ Note that this does not mean that there are no domain restriction effects with them whatsoever. The prediction simply is that they cannot be interpreted relative to a contextually salient situation (distinct from the topic situation). Testing this prediction empirically is no small feat, but I offer the following as a first piece of supporting evidence:

- (90) *Context:* I tell you that I'm teaching a semantics class and that I advertised a university wide talk by a famous person from the field last Friday. I also tell you that I was hopeful that many of the students from my class would show up, so I was excited when I was about to enter the room.

⁵³Thanks to Sigrid Beck (p.c.) for raising this issue in exactly these terms.

⁵⁴This was exactly what was needed to account for the lack of transparent interpretations, of course. One of the novel features of the present account is that it links this to domain restriction.

You: So what happened when you entered the room?

Me: Well,

- a. there were exactly three students in attendance.
- b. exactly three students were in attendance.

Consider a scenario where a total of 5 students are in the audience, three of which are in my class. I believe that I could have spoken truthfully by uttering (90-b), but not by uttering (90-a). If the topic situation is determined by the question under discussion, this is as expected. The weak DP in (90-a) has to be interpreted relative to the situation containing everybody in the room, which makes its sentence false, since there are 5 students in the room. The availability of a strong, quantificational interpretation of the DP in (90-b), on the other hand, makes it possible to evaluate the noun phrase relative to the contextually salient situation of students in my class, and under that interpretation, the sentence is true. While the issue warrants further investigation, this example thus at least provides a first piece of evidence supporting the prediction under consideration.

5.3 Other Candidate Locations for Situation Pronouns

The focus of this article has been on situation pronouns inside of DPs. On a more general level, the approach I took was that rather than having the semantic situation argument of every predicate be saturated by a syntactically represented situation pronoun, we should only introduce situation pronouns where we have empirical evidence for them. This raises the question, of course, in what other places we find such evidence. One possibility that I already mentioned concerned Austinian topic situations, which, if we choose to represent them syntactically, would be introduced at the top of the clause.

Another, though at least potentially related, location where situation pronoun seem to be needed is inside of relative clauses. In the temporal domain, it has been argued that the tense in a relative clause does not have to be interpreted relative to the tense in the matrix clause, even when the DP containing it has to take scope below the matrix verb (which rules out a scope account [Kusumoto, 2005](#)). The following example is an illustration of this so-called later-than matrix interpretation:⁵⁵

(91) **Hillary married a man that became president.**

[Kusumoto \(2005\)](#)

The fact is, of course, that Bill only became president after he married Hillary, which means that the past tense on *became* has to be interpreted relative to the time of utterance, rather than relative to the time introduced by the past tense on *married*. This suggests that there is a time (or situation) pronoun in the relative clause that can pick out the utterance time (or situation), even when occurring in the scope of a temporal operator (the matrix tense).

A similar phenomenon arises with respect to possible worlds. Imagine that John has the incorrect belief that the man Hillary married is from Alabama. Furthermore assume that John has no idea how tall Hillary's husband is (he actually is 6ft 2.5 inches). I think (92) can be uttered truly in this scenario:

(92) **John thinks that Hillary married an Alabaman that is 6 ft 2.5 inches tall.**

⁵⁵This example doesn't rule out a scopal account. See [Kusumoto \(2005\)](#) for detailed discussion of such cases.

If this is indeed so, then that would also seem to require that there is a situation pronoun in the relative clause which makes it possible to interpret the relative clause (but not the noun *Alabaman*) relative to the actual world, despite the fact that it appears in the scope of a modal operator.

Another set of data lends further support to the notion that relative clauses have special properties with respect to their intensional status. These are variants of the data involving *fake* in our discussion on domain restriction. Note that prenominal modifiers and relative clauses that - on their simplest analysis - should be equivalent to them differ in terms of their behavior in intensional contexts such as the one created by *fake*:

- (93) a. **A fake American philosopher was at the conference.**
b. **A fake philosopher that is American was at the conference.**

Only (93a) is compatible with a scenario in which the person in question is a real philosopher that pretends to be American. In this respect, relative clauses behave just like a *C*-variable would on a *C*-variable account of domain restriction (see the discussion of (77) in section 4). While I'm not in a position to present a full analysis of this example, assuming a situation pronoun in the relative clause at least leads us to expect that the attested interpretation is possible, namely by interpreting that situation pronoun transparently.

Yet another construction that might call for a situation pronoun is that of comparatives. It has long been known that there are ambiguities involving the intensional status of predicates in comparatives, as in the following famous example by Russell:

- (94) I thought your yacht was larger than it was.

The predicate in the *than*-clause has to be interpreted relative to the actual world, whereas the predicate in the main clause has to be interpreted relative to the *thought*-worlds. Based on this and similar examples with counterfactuals, von Stechow (1984) already argued that to account for the full range of data, we have to allow for transparent interpretations of predicates in the *than*-clause (to allow for an interpretation of the predicate relative to the actual world even though it remains in the scope of the intensional operator at LF). Of course, that is exactly what situation pronouns are good for. Given that at least one popular family of analyses sees comparatives as quantifiers over degrees, this may be yet another case where a quantifier introduces a situation pronoun.⁵⁶

Once more, I have to leave further exploration of these issues to future research. There may well be other locations where we find evidence for situation pronouns beyond the ones mentioned here. But based on the present account, it should at least be relatively clear what the research agenda for identifying such locations should look like.

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⁵⁶This is not to say that other analyses of comparatives aren't compatible with introducing situation pronouns. In fact, I assume that definite determiners, which I take not to be quantificational, also take a situation pronoun argument, so there's no perfect correlation between the presence of situation pronouns and *bona fide* quantificational expressions.

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