

## Situation Pronouns and Nominal Domain Restriction

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**Abstract** This paper argues in favor of a situation semantic account of nominal domain restriction. I begin by proposing a situation semantic system using syntactically represented situation pronouns which is motivated by well-known facts about transparent interpretations. I then argue that this system makes predictions for domain restriction in noun phrases that are very successful empirically while maintaining a great degree of theoretical parsimony, as the relevant effects are captured solely by using devices that are independently motivated. After briefly reviewing the data on transparent interpretations and introducing the semantic formalism, I show how situation pronouns inside of noun phrases automatically make predictions concerning domain restriction, and that these capture the standard data in this area. Furthermore, I show that such a system has a number of advantages over its main competitor, one using *C*-variables (which are variables for predicates), including a conceptual advantage in terms of overall theoretical parsimony, the absence of problems with respect to the syntactic location of the relevant variables, as well as data on German definites and different types of bridging uses thereof. I also argue that one recent challenge to situational accounts of domain restriction, brought forth by Elbourne (2008) does not undermine the present proposal. In closing, some directions for further extensions are explored.

**Keywords** Situation Semantics · Domain Restriction · Quantifiers · Semantics of Noun Phrases · Definite Descriptions · Incomplete Descriptions · Bridging

### 1 Introduction

Natural language is commonly assumed to have 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. One place where such *situation pronouns* are standardly posited is inside of (extended) nominal projections. An important motivation for this are so-called transparent interpretations of quantifiers, where the quantifier

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takes quantificational scope under some intensional operator, while the nominal predicate gets evaluated with respect to a possible situation different from the one that the intensional operator quantifies over. In this paper, I explore the implications of a specific implementation of such a semantic system for phenomena related to quantifier domain restriction. Given their inherently partial nature, situations have frequently been proposed as a means of providing such domain restriction. However, such discussions have, for the most part, not been explicitly tied to the independent motivation of syntactically represented situation pronouns based on transparent interpretations. I essentially take it for granted that these are in fact needed, but briefly review some of the motivations. I then go on to explore what a system based on this assumption has to say about domain restriction effects. The approach is thus based on a plea for theoretical parsimony. Assuming that situation pronouns are independently motivated, any domain restriction effects that can be captured based on their presence in the system *should* be captured in terms of them, rather than by introducing another device. There is, of course, a device that will have to serve as the standard of comparison, namely so-called *C*-variables - variables that are place-holders for contextually supplied predicates. I will argue that - at least as far as domain restriction in nominal projections is concerned - a system using syntactically represented situation pronouns can cover at least as much ground as standard *C*-variable approaches, and in fact has a number of advantages on empirical grounds. This, combined with the conceptual advantage of added theoretical parsimony, will be taken as strong evidence in favor of a semantic system where nominal domain restriction is dealt with in terms of situations, rather than *C*-variables.

While my discussion for the most part focuses on the comparison between two variants of accounts that make a syntactically represented variable responsible for domain restriction effects, and thereby side-steps another important family of accounts, which employ a purely pragmatic enrichment approach (Recanati, 1996; Neale, 2004; Bach, 1994), I do include some considerations that serve to contrast the present proposal with these non-representational accounts as well. However, a full comparison between these would go beyond the scope of the present paper (see Stanley, 2007; Recanati, 2004; Elbourne, 2008, among others, for more general discussion comparing them).

The paper is organized as follows. In section 2, I briefly review the general motivations for representing situation pronouns syntactically and introduce the semantic system I will work with. Section 3 introduces the main issues related to quantifier domain restriction. I then go on to show that all the relevant phenomena can be dealt with in the present situation semantic system. In section 4, I argue that it has some distinct advantages over standard *C*-variable accounts, e.g., with respect to the issue of the syntactic location of the variables responsible for domain restriction. Furthermore, I consider novel empirical evidence involving different types of definites in German and their behavior in bridging uses. Section 5 turns to one recent challenge to situational accounts of domain restriction, brought forth by Paul Elbourne (Elbourne, 2008), and argues that it does not ultimately undermine the situation based approach. Section 6 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).<sup>1</sup> 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 noun phrases, I will only review the former very briefly, and pay closer attention to the latter.

### 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

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<sup>1</sup> This section is a slightly shortened and adjusted version of parts of Schwarz (2011, sections 2-3), which argues for the specific implementation of introducing situation pronouns as arguments of determiners based on more detailed considerations about the distribution of transparent interpretations.

operators to bind them quantificationally, or - equivalently - by allowing infinite sequences of evaluation indices (Cresswell, 1990). The bottom line of these discussions typically assumed in the literature is that natural language has the expressive power of quantifying over situations (or world or times) in the object language.

## 2.2 The Intensional Independence of DPs

Since early on in work on intensional semantics of natural language, it has been noted 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; Bäuerle, 1983).<sup>2</sup> 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. A similar issue arises with so-called scope paradoxes in conditionals (von Stechow, 1984; Abusch, 1994; Percus, 2000; Keshet, 2008), e.g., in (5):

- (4) If every semanticist owned a villa in Tuscany, what a joy the world would be.  
(Percus, 2000)
- (5) If everyone in this room were outside, the room would be empty.  
(Keshet, 2008)

Assuming the first sentence is uttered by a semanticist, we are inclined to understand this to be a claim about actual semanticists, since the speaker likely is expressing his excitement about the hypothetical prospect of owning a villa in Tuscany. The second example makes the same point, perhaps even more forcefully. 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 these types of example 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 example.<sup>3</sup>

- (6) a. Every fugitive is now in jail. (Enç, 1981)  
b. When everyone in this room was outside, it was empty. (Keshet, 2008)

<sup>2</sup> What 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.

<sup>3</sup> For a recent and detailed presentation of parallel effects for times and worlds, see Keshet (2008).



I'd like to make explicit an important terminological and conceptual distinction that will be important for what is to come, namely that between semantic situation arguments and syntactically represented situation pronouns.<sup>6</sup> 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  $\lambda s$  at some point), these do not necessarily get saturated by syntactically represented situation pronouns.<sup>7</sup> The term 'situation pronoun' will be reserved for syntactically represented situation pronouns.

## 2.3 A Semantic System with Situation Pronouns

### 2.3.1 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.<sup>8</sup> 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  $s'$ ').<sup>9</sup>

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):

(9) a. **Functional Application (FA)**

If  $\alpha$  is a branching node and  $\beta, \gamma$  the set of its daughters, then, for any context  $c$  and any assignment  $g$ ,  $\alpha$  is in the domain of  $\llbracket \cdot \rrbracket^{c,g}$  if both  $\beta$  and  $\gamma$  are, and  $\llbracket \beta \rrbracket^{c,g}$  is a function whose domain contains  $\llbracket \gamma \rrbracket^{c,g}$ . In that case,  $\llbracket \alpha \rrbracket^{c,g} = \llbracket \beta \rrbracket^{c,g} (\llbracket \gamma \rrbracket^{c,g})$ .

<sup>6</sup> As 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 situation argument inside of DPs, 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.

<sup>7</sup> In fact, they never get saturated by a situation pronoun directly inside of NPs, as these are introduced as complements of determiners.

<sup>8</sup> For further details on the ontological commitments one has to make in this type of system, see Kratzer (1989).

<sup>9</sup> ' $\leq$ ' 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.

b. **Predicate Modification (PM)**

If  $\alpha$  is a branching node and  $\beta, \gamma$  the set of its daughters, then, for any context  $c$  and any assignment  $g$ ,  $\alpha$  is in the domain of  $\llbracket \cdot \rrbracket^{c:g}$  if both  $\beta$  and  $\gamma$  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**

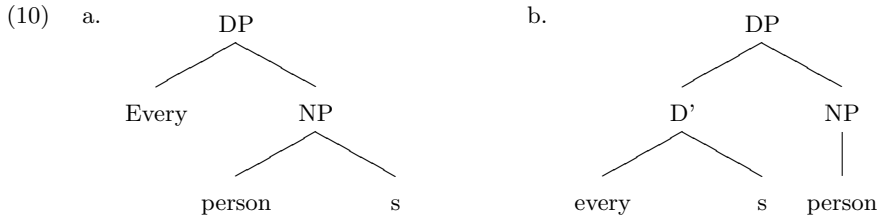
If  $\alpha$  is a pronoun or a trace,  $g$  is a variable assignment, and  $i \in \text{dom}(g)$ , then  $\llbracket \alpha_i \rrbracket^{c:g} = g(i)$ .

d. **Predicate Abstraction**

For all indices  $i$  and assignments  $g$ ,  $\llbracket \lambda_i \alpha \rrbracket^g = \lambda x. \llbracket \alpha \rrbracket^{g^{x/i}}$

### 2.3.2 DPs and Beyond

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 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), von Stechow and Heim (2007), and Keshet (2010) for example, assume that situation pronouns appear inside of the NP, so that determiners combine with an object of type  $\langle et \rangle$ , while Büring (2004) and Schwarz (2011) introduce situation pronouns with determiners:<sup>10</sup>

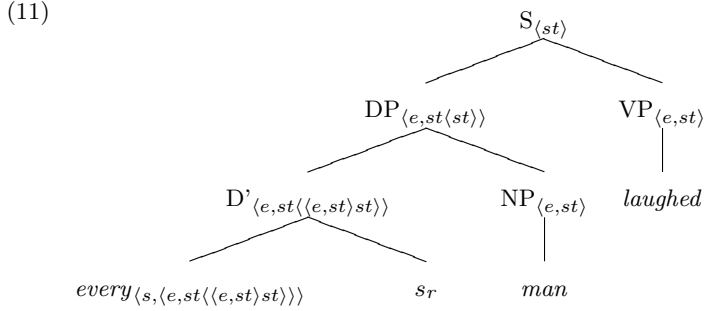


While much of the following does not depend on a choice between the two structures, I will follow the second option here. To the extent that the present discussion is not affected by this decision, this move is just for concreteness sake. But see section 6.2 for data where it becomes relevant for the present purposes, and Schwarz (2011) for arguments in favor of this structure.

I will now introduce the semantic system that incorporates DP-meanings suitable for the structure in (10b). 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. 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,

<sup>10</sup> Note that Büring introduces the situation pronoun as an index on the determiner, rather than in a separate node of its own.

2007). In the structures discussed below, this will correspond to the situation associated with the  $\lambda$ -abstractor over situations at the level of the entire sentence. The basic structure of a simple sentence with a quantifier 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 fairly standard, with denotations of type  $\langle e, \langle s, t \rangle \rangle$  (12, 13). The full meaning of quantificational determiners gets somewhat complex once we take all issues into consideration. For ease of presentation, I will allow myself to work with oversimplified entries, such as the one in (14) for *every* when this causes no harm for the point under consideration.<sup>11</sup>

$$(12) \quad \llbracket laugh \rrbracket = \lambda x \in D_e. \lambda s \in D_s. \text{ laugh}(x)(s)$$

$$(13) \quad \llbracket man \rrbracket = \lambda x \in D_e. \lambda s \in D_s. \text{ man}(x)(s)$$

$$(14) \quad \llbracket every \rrbracket = \lambda s_r \in D_s. \lambda P \in D_{\langle e, st \rangle}. \lambda Q \in D_{\langle e, st \rangle}. \lambda s \in D_s. \forall x [P(x)(s_r) \rightarrow Q(x)(s)]$$

Crucially, this entry for *every* allows the nominal restrictor phrase of the quantifier to be evaluated with respect to a situation different from the one in which the nuclear scope is evaluated. To compute the meaning of (11), we simply need to combine the meanings of all the pairs of sister nodes via functional application, which will yield the following proposition:

$$(15) \quad \llbracket (11) \rrbracket^g = \lambda s. \forall x [\text{man}(x)(g(r)) \rightarrow \text{laugh}(x)(s)]$$

Since the variable introduced by the situation pronoun on *every*,  $s_r$ , remains free in the structure in (11), it receives a value via the assignment function  $g$ . Assuming the contextually supplied situation is part of the actual world, this will render a transparent interpretation in cases where the structure in (11) is embedded under an intensional operator.

<sup>11</sup> Here 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 ' $\text{laugh}(x)(s)$ ', is to be understood as a short form for ' $x$  laughs in  $s$ '.





### 3 Domain Restriction and Situation Pronouns

I begin this section with a brief review of basic data on quantifier domain restriction and theoretical accounts based on a contextually supplied *C*-variable, and then go on to introduce an alternative, situation semantic account. Section 4 then provides a number of arguments in favor of the latter.

#### 3.1 Domain Restriction with a *C*-variable

##### 3.1.1 Domain Restriction Variables in Noun Phrases

One common approach to analyzing nominal 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.

- (20) 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 Stechow, 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 Stechow’s (1994) terminology. As von Stechow (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:

- (21) The pig is grunting, but the pig with floppy ears is not grunting.

(Lewis, 1973, pp. 111-117)

- (22) 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)

- (23) 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 (24), have been argued to provide a strong argument in favor of syntactically represented domain restriction variables inside of DPs (von Fintel, 1994).<sup>13</sup>

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

These are generally taken to 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).<sup>14</sup>

In technical terms, the idea of representing domain restriction in the syntax can be implemented by assuming that determiners  $\delta$  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.<sup>15</sup>

$$(26) \llbracket \delta_c \rrbracket^g = \lambda P_{\langle e,t \rangle} . \lambda Q_{\langle e,t \rangle} . \delta^* \langle P \cap g(C), Q \rangle$$

(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 (24),  $f$  would be a (one-place) function mapping individuals to sets of questions, for example, and in (25) 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).

- (27) a. Every farmer who owns a donkey beats it.  
b. *it*:  $[_{DP} \text{ the } [_{NP} [_N R_{\langle \gamma, \langle e, et \rangle} \rangle]] [_{DP} \text{ pro}_{\langle 1, e \rangle}]]]$   
 $g(7) = \lambda x . \lambda y . y \text{ is a donkey that } x \text{ owns}$   
(In Heim and Kratzer's (1998) version of Cooper's (1979) approach)

<sup>13</sup> See also Stanley and Szabo (2000), as well as Elbourne (2008) for a more skeptical take on this argument.

<sup>14</sup> Note that the situation semantic framework here provides a different perspective on this particular issue, as will become clear in the following sections.

<sup>15</sup> The schema is adapted from von Fintel (1994, p. 31) to the  $\lambda$ -notation used here.  $\delta_c$  stands for a quantificational determiner as a natural language expression,  $\delta^*$  for the relation between sets that that determiner denotes.

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

b.  $\llbracket \text{the pen} \rrbracket^g = \iota x. R_{\langle \gamma, \langle e, et \rangle \rangle}(y)(x) \ \& \ \text{pen}(x)$ <sup>16</sup>  
 $g(7) = \lambda y. \lambda x. x \text{ was given to } y$

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

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

In (27a), *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.<sup>17,18</sup> Similarly, Chierchia proposes for (28a) 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).

### 3.2 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 2.3, domain restriction in (strong) DPs is provided by the syntactically represented situation pronoun introduced with the determiner, whose presence is independently motivated by the existence of 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 2.3, the standard options for interpreting pronouns more generally are available: they can receive a contextual value, either by being identified with the topic situation (via the binding operator  $\Sigma$  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  $\Sigma$ , adjoined below the relevant

<sup>16</sup> It’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.

<sup>17</sup> More precisely, that each farmer beats the unique donkey he owns. This is problematic insofar as (27a) can be true even if some farmers own more than one donkey. I won’t discuss the details of this problem here.

<sup>18</sup> See Elbourne (2005) for arguments against this type of account and in favor of a situational analysis.

quantifier). The schematic illustration of these options is repeated below (where ‘OP’ stands for a quantifier over situations, as before).

- (18) ...  $\Sigma_r$  [... OP [ $VP$  ... [[ $D$   $s_r$ ] NP] ...]] ( $s_r$  = topic situation)  
 (19a') ... [... OP [ $VP$  ... [[ $D$   $s_r$ ] NP] ...]] ( $s_r$  remains free)  
 (19b) ... OP [ $\Sigma_r$  [ $VP$  ... [[ $D$   $s_r$ ] NP] ...]] ( $s_r$  bound by OP)

Examples for each of these options will be discussed below using quantificational DPs and definite descriptions. While the focus will be 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).

### 3.2.1 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 (29) in these terms:

- (29) 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 (29) 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 important to have at least a working version of a 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).<sup>19</sup> In the case above, the QUD could be something like *What was going on in Amherst on the morning of February 10th, 2010?* (29) 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 (30) provides another illustration:

- (30) QUD: What did the people in the kitchen do after John told his joke?

<sup>19</sup> Though the proposal is compatible with other theories of questions as well.

- a. Everyone laughed.
- b.  $s_{topic}$ : ‘The situation exemplifying what the people in the kitchen did after John told the joke’
- c.  $[\Sigma_I \text{ [[every } s_I \text{ ] person ] laughed } ]]$
- d.  $[[\text{(30c)}]] = \lambda s. [s \approx s_{topic} \ \& \ \forall x[\text{person}(x)(s) \rightarrow \text{laugh}(x)(s)]]$ <sup>20</sup>

The sentence in (30a) 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  $\Sigma$ -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 verb *laughed*. What a speaker claims when uttering (30a) in the provided context, according to our theory, is the proposition in (30d). In set-theoretic terms, this is the proposition that contains every situation that is a counterpart of the topic situation and in which every individual contained in it laughs.

### 3.2.2 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 (31), due to Soames (1986) (who provides it as a variation of an example by Barwise and Perry (1983)), is a case in point.

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

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 (31), assuming a simplified meaning for *every*, would then be as follows:

- (32) a.  $[[\text{[every } s_r \text{ ]one}][\text{[is asleep}][\text{and being monitored by an RA}]]]$   
 b.  $[[\text{(32a)}]]^g = \lambda s. [\forall x[\text{person}(x)(g(r)) \rightarrow$   
 $\text{[asleep}(x)(s) \ \& \ \exists y [\text{RA}(y)(s) \ \& \ \text{monitoring}(y)(x)(s)]]]]]$   
 (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, most plausibly one that contains all and only the research subjects at hand.

<sup>20</sup> The specific presentation of the meaning here is most naturally derived if we assume a syntactically represented topic situation. But since I’m not addressing this issue here, this should only be seen as a choice of convenience for illustrating the role of the topic situation. ‘ $\approx$ ’ here stands for the counterpart relation. See Schwarz (2009) for details.

Another example illustrating the need for interpreting situation pronouns relative to contextually supplied situations comes from Cooper (1995).

- (33) 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 voting members of the 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 is perfectly feasible to come up with a restrictive theory about this, just as in the case of personal pronouns.<sup>21</sup>

### 3.2.3 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 the structure. 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 situation semantic analyses of 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.

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

(Rothstein, 1995)

<sup>21</sup> Note also that  $C$ -variable accounts face parallel issues in terms of what affects the choice of their value.

Crucially, (34) 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 (34) 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 (34) is the following:

$$(35) \quad \forall e[\text{RING}(e) \ \& \ \text{Th}(e) = b \rightarrow \\ \exists e'[\text{OPEN}(e') \ \& \ \text{Ag}(e') = m \ \& \ \text{Th}(e') = d \ \& \ M(e') = e]]$$

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. (36) is a version of her lexical entry for *every*, adapted to our system.<sup>22</sup>

$$(36) \quad \llbracket \textit{every} \rrbracket = \lambda s_r. \lambda P. \lambda Q \lambda s. \forall x [P(x)(s_r) \rightarrow \exists s_1 [s_1 \leq s \ \& \ M(s_1) = x \ \& \ Q(x)(s_1)]]$$

A sentence with two universal quantifiers, where the domain of the lower quantifier covaries with the higher one, is then interpreted as follows:<sup>23</sup>

$$(24) \quad \text{a. Everyone answered every question.} \\ \text{b. } \lambda s. \forall x [\text{person}(x)(s) \rightarrow \\ \exists s_1 [s_1 \leq s \ \& \ M(s_1) = x \ \& \ \forall y [\text{question}(y)(s_1) \rightarrow \text{answered}(y)(x)(s_1)]]] \\ \text{(adapted from Kratzer, 2004)}$$

In order to derive this interpretation in our system, the situation pronoun on the lower *every* has to be bound by a  $\Sigma$  adjoined below *everyone*. This requires the type-variant of  $\Sigma$  in (37), as it has to combine with an XP of type  $\langle e, st \rangle$  in such cases. The structure of (24) from which the interpretation above is derived is provided in (38).<sup>24</sup>

$$(37) \quad \llbracket \Sigma_n \text{ XP} \rrbracket^g = \lambda x. \lambda s. \llbracket \text{XP} \rrbracket^{g[s_n \rightarrow s]}(x)(s) \quad \text{Büring (2004), for XPs of type } \langle e, st \rangle$$

$$(38) \quad \llbracket \llbracket \textit{Every } s_r \rrbracket \textit{ one} \rrbracket [\Sigma_{r'} [\textit{answered} [\llbracket \textit{every } s_r \rrbracket \textit{ question} \rrbracket]]].$$

<sup>22</sup> As before, I’m using a simplified meaning of *every* to focus on the issues at hand.

<sup>23</sup> Presumably, 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.

<sup>24</sup> Note that I’m omitting representation of quantifier raising for simplicity sake. If we did include this, *every question* would of course have to be raised to a position below  $\Sigma$ , in order to allow for the DP’s situation pronoun to be bound by it.



On the analysis in (24), the sentence says that for every person in  $s$  there is a situation  $s_I$  in which he or she answered every question 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 (34) requires there to be a different door-opening for each bell-ringing, (24) does not require an interpretation where different people have different questions to answer. They could all have the same set of questions, or partially overlapping ones, or completely different ones.<sup>25</sup> This is not prevented by the requirement introduced by the matching function that there be different situations in which each person answered every question, because the situations will minimally differ, in any case, in terms of what individuals must be part of them (in order to answer a question 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 (24), it might be the function that assigns questions to people, for example. More specifically, to account for the possibility of partial or total overlap of questions for various people, it will have to be something like the following:

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

To render the appropriate interpretation of (24),  $s$  has to contain every question assigned to  $x$ . It also has to contain  $x$ , in case there is another individual that has the same set of questions. Since  $M$  is a function, it has to assign exactly one value to each element in its domain. If two individuals have the same questions, we can only map the situation containing these questions 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 (40).

- (40) 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

<sup>25</sup> Different 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.

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, 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.<sup>26</sup>

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.

### 3.2.4 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 either be identified with the topic situation (by being bound by a  $\Sigma$  at the top of the sentence) or a contextually salient situation (by receiving a value via the assignment function), or, alternatively, be quantificationally bound by a quantifier over situations.

## 4 Comparison between *C*-variable and situational accounts

We now have seen how *C*-variable accounts and situational accounts deal with the basic data concerning nominal 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 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 with respect to which the accounts arguably come apart. First, I reiterate the conceptual advantage of a situational account in terms of its theoretical parsimony. The second point concerns the precise location of the variable that brings about domain restriction. The third relates to a contrast in bridging uses of two different types of definite articles in German, which can be dealt with in a situation based account, while a *C*-variable account faces a problem of overgeneration.

### 4.1 The Conceptual Advantage

In beginning this comparison, I'd like to expand my comments on what I take to be the 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).<sup>27</sup> Putting the same point slightly differently, we

<sup>26</sup> Unless, 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.

<sup>27</sup> Given 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.

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 we can capture with the independently motivated mechanisms of our semantic theory before introducing any additional machinery.

As I've shown above, once we adopt a situation semantics, domain restriction effects in noun phrases due to the partiality of situations come for free. In particular, a semantic system that posits situation pronouns inside of noun phrases automatically make predictions about domain restriction effects. Considering the data above, a theory based on situation pronouns (paired with other independently needed mechanisms) suffices to account for the central domain restriction phenomena with noun phrases we considered. At least to the extent to which one accepts the independent motivations for situation pronouns, using them to capture domain restriction effects as well is the most parsimonious route.

## 4.2 The Location of Domain Restriction Variables

One important question that arises for any account that posits syntactically represented variables to capture domain restriction effects is where the domain restriction variable is introduced into the logical form. While there hasn't been much discussion of this for situation pronouns (but see Schwarz, 2011), this issue has been discussed at length for *C*-variables. One view is that it is introduced with the determiner (Westerstahl, 1984; von Stechow, 1994; Martí, 2003; Elbourne, 2008). Another possibility is that it is introduced with the nominal restrictor. Stanley and Szabo (2000) and Stanley (2002) have provided 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.

In the following, I will briefly review the arguments for both positions, and conclude that the conflicting evidence that they provide is hard to reconcile. I then move on to show that the data at hand do not create the same tension on the situational perspective, as they are compatible with either introducing situation pronouns with determiners or inside of the NP proper (though not with the noun itself).

### 4.2.1 The Location of *C*-variables

The first argument in favor of introducing *C*-variables with nouns, 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.

(41) 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, ideally, one would wish to say that cross-sentential anaphora of this sort requires antecedents that are constituents (nodes) of a preceding logical

form,<sup>28</sup> placing the domain restriction on the noun (*Most [people<sub>C</sub>]*) allows a straightforward derivation of reading 1, since the pronoun *they* simply can have *people<sub>C</sub>* as its antecedent (Stanley and Szabo, 2000, p. 257).<sup>29</sup> If the domain restriction variable were on the determiner (*Most<sub>C</sub> [people]*), there would be no antecedent node denoting the set of people in the village.<sup>30</sup>

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.

- (42) If *x* is a pronoun that is anaphoric on, but not c-commanded by a non-maximal quantifier “[Dx:Fx]” that occurs in an antecedent clause “[Dx:Fx](Gx)”, then *x* is interpreted as “[the *x*: Fx & Gx].”

(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 (41) makes a claim about all screaming people in the world (Stanley and Szabo, 2000).

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

- (43) 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<sub>{*x*|*x* is a Cornell student}</sub>  
 $\approx$  ‘The unique individual *x* such that *x* is the tallest person of all Cornell students’  
 e. The<sub>{*x*|*x* is a Cornell student}</sub> 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 (43b), 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 (43c), placing the domain restriction variable on the noun yields the intuitively correct result that we are making a claim about the tallest Cornell student (43d). 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 (43e). This, in turn, would yield the strange result that

<sup>28</sup> It 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’.

<sup>29</sup> Stanley (2002) emphasizes that, on their account, *C* does not occupy a node of its own.

<sup>30</sup> As Elbourne (2008) points out, assuming that pronouns are determiners (Postal, 1969) whose NP-complements undergo ellipsis may undermine this argument.

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.<sup>31</sup>

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.

- (44) 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 (44) 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.<sup>32</sup> First, it makes false predictions for non-intersective adjectives such as *fake* and *alleged* (Breheny, 2003).

- (45) a. Every fake philosopher<sub>C</sub> 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 (45a) should be equivalent to (45c). 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 (45c), but not to (45a) (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

<sup>31</sup> As 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. See also Elbourne (2008) for an argument precisely along these lines.

<sup>32</sup> My discussion of these problems follows the one in (Kratzer, 2004) rather closely. Elbourne (2008) provides an additional argument in favor of introducing  $C$ -variables with determiners, which will be discussed in section 5.

to the situation argument on the overt noun. This, however, is contrary to what has emerged for other modifiers in the recent literature. Keshet's (2008) Intersective Predicate Generalization (see also Keshet, 2010) states 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. 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 (above *fake*) 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.

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 remains problematic.<sup>33</sup>

#### 4.2.2 The Location of Situational Domain Restriction

In light of the issues with respect to the location of the *C*-variable that we just encountered, we should examine whether a situation semantic approach to domain restriction

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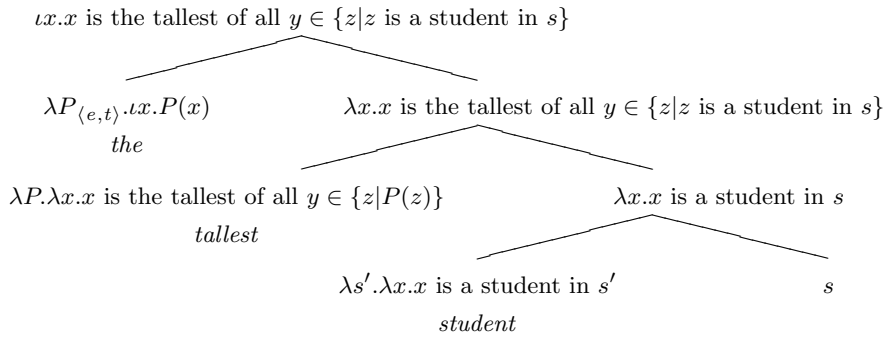
<sup>33</sup> Kratzer (2004) presents further problems, including a very general one for approaches using this type of domain restriction variable. The problem is that, given the way we have implemented the domain restriction variable approach, via a free variable that typically receives a value via 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 restriction variables do not seem to be able to pick up antecedents anaphorically in the way we would expect.

faces parallel issues. In the following, I will show that the location problem does not arise for the situational approach developed here.

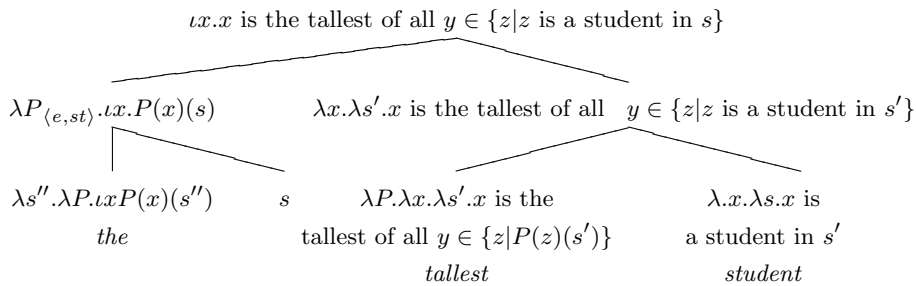
*Superlative Adjectives* I have assumed in section 2.3 that situation pronouns are introduced at the level of the DP. Stanley (2002) used examples involving superlative adjectives to argue against introducing the  $C$ -variable with the determiner. Let us consider, then, whether the location of situation 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.

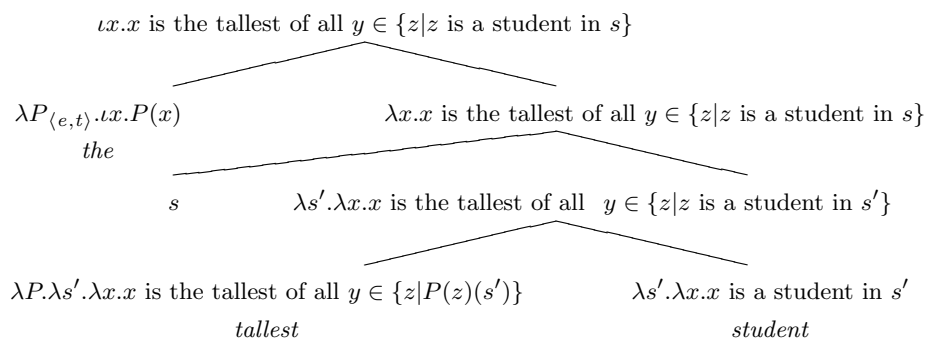
(46) Situation Pronoun on noun:



(47) Situation Pronoun on D:



## (48) Situation Pronoun on NP



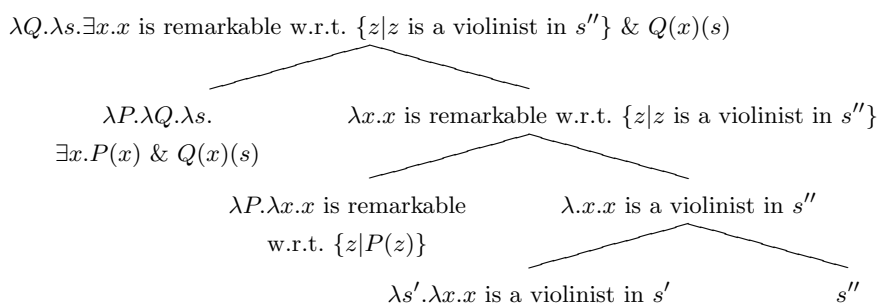
Superlative adjectives then do not place any restrictions on where inside of DPs we should introduce the situation pronoun.

*Comparison Classes* The second argument to consider is that of comparative adjectives and the effect of domain restriction on their comparison class. Recall that (44) 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.

## (44) Smith is a remarkable violinist. (Stanley, 2002)

As in the case of superlative adjectives, it seems not to matter where in the structure we place the situation pronoun.<sup>34</sup>

## (49) Situation Pronoun on noun:



<sup>34</sup> If we assume one to be present at all, that is. Assuming that we are dealing with a weak DP and follow the line of thought spelled out in Schwarz (2011), building on Keshet (2010) and Musan (1995), there may not be a situation pronoun here at all. That would not cause any problem, either, as far as the determination of the comparison class is concerned, since the domain restriction could just as well be provided by the topic situation.





which gives us the desired interpretation. Adjectives like *remarkable* thus 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).

(52) 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  $\iota x.\text{people}(x)(s)$ ,<sup>36</sup> 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. For example we might spell out a 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). While accounting for anaphoric relations purely in terms of situations is no simple feat (and maybe isn't even the right approach for all anaphoric phenomena), 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 4.2.1 carries over to situational domain restriction: situation pronouns can't be on the noun itself if we want to account for the interpretation of the relevant noun phrases, such as the one in (53).

(53) the fake philosopher

The reason is slightly different from the situational perspective, however, and, in fact, basically parallel to what we saw for *remarkable* above. *Fake* is an intensional adjective and has to combine with a property, not a set of individuals. If we put a situation pronoun on the noun before it combines with the adjective, then it will only provide a set of individuals for the latter to manipulate. 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.

<sup>36</sup> Where the  $\iota$ -operator gets a suitable maximality interpretation for the plural noun, and  $s$  will be the contextually supplied value for the situation pronoun.



with definites. Using data from Schwarz (2009), which is concerned with two different types of definite articles in German, I will argue that a *C*-variable account of bridging phenomena runs into problems of overgeneration.

#### 4.3.1 Background: Two types of Definites in German

Various languages have more than one paradigm for the expression of definite articles. In standard German, the contrast between so-called ‘weak’ and ‘strong’ articles is visible in configurations where the definite and a preceding preposition can contract:

- (55) a. *an dem Stuhl*  
on the<sub>strong</sub> chair  
b. *am Stuhl*  
on-the<sub>weak</sub> chair  
‘on the chair’

Generally speaking, the strong article is associated with anaphoric uses of definites (i.e., uses where there is a preceding linguistic expression that determines the referent of the definite), whereas the weak article is used when there is a unique referent with the property expressed by the noun in the context of interpretation. Schwarz (2009) analyzes the latter in terms of a Fregean, presuppositional uniqueness account, with domain restriction provided by a situation pronoun, while the former comes with an anaphoric index (essentially a silent pronoun) in the structure, in order to model its anaphoric properties. While the details of the account go beyond the present space limitations, what is crucial is that different types of bridging uses of definites are expressed by weak and the strong articles.

#### 4.3.2 Bridging with Weak and Strong Articles

Schwarz (2009) shows that two different types of bridging require different definite articles. Part-whole bridging, as in (56), requires the weak article, whereas bridging involving a product and its producer, as in (57) requires the strong article.<sup>39,40</sup>

- (56) *Jedes Auto, das ein Student parkte, hatte am / #an dem*  
Every car that a student parked had on-the<sub>weak</sub> / on the<sub>strong</sub>  
*Rückspiegel einen Parkschein hängen.*  
rear view mirror a parking-pass hanging  
‘Every car that a student parked had a parking pass hanging on the rearview mirror.’
- (57) *Jeder Roman, den Peter gekauft hat, war ihm aufgefallen, weil er schon*  
Every novel that Peter bought has was him noticed because he already  
*einmal eine Kurzgeschichte #vom / von dem Autor gelesen hatte.*  
once a short story by-the<sub>weak</sub> / by the<sub>strong</sub> author read had  
‘Every novel that Peter bought had come to his attention because he had already once read a short story by the author.’

<sup>39</sup> The latter is not presented as a category of any theoretical status, but rather is an instantiation of a more general case where the two entities in question stand in no particular situational relationship to one another.

<sup>40</sup> This contrast also seems to exist in other languages and dialects, such as Fering (Ebert, 1971) and Mauritian Creole (Wespel, 2008).

As these examples show, both types of bridging are available with covarying interpretations of the definites.<sup>41</sup> With respect to our discussion of domain restriction, this contrast is rather instructive. Consider what Chierchia’s approach above would have to say about these cases.

First, the fact that there’s a contrast between the two articles means that they differ in the domain restriction options available to them. This in turn, could only be modeled if domain restriction variables are introduced with determiners. For if they were introduced with the noun, then we wouldn’t expect the choice of determiner to make a difference. Since the example in (57) is parallel to Chierchia’s (54a), the obvious move might be to propose that the strong article does come with a (possibly complex) *C*-variable to extend the analysis to that case.

What about the weak article, then? Can its covarying interpretation be accounted for without a *C*-variable? The only way of doing so that I can think of is in a situation semantic system like the one developed in section 2.3. Here, a covarying interpretation does not even require a situation pronoun, as a DP in the scope of a quantifier over situations will automatically be interpreted relative to the situations quantified over if it does not have a situation pronoun.<sup>42</sup> However, other examples show that weak article definites can be interpreted relative to other situations as well, which does require the independence provided by the presence of a situation pronoun.<sup>43</sup> Take the following German variant of Cooper’s example (33a), or the example in (59)

- (58) Context: The departments of linguistics and philosophy are hosting a joint talk series. Each speaker was introduced by one of the two colloquium committee co-chairs, one of them a linguist, one a philosopher.

*Jeder Linguist wurde vom Linguisten vorgestellt, und jeder Philosoph*  
 every linguist was by-the<sub>weak</sub> linguist introduced and ever philosopher  
*vom Philosophen.*  
 by-the<sub>weak</sub> philosopher

‘Every linguist was introduced by the linguist and every philosopher by the philosopher.’

- (59) *Seit 1995 hat Michelle Obama jedes Jahr vom Präsidenten eine*  
 Since 1995 has Michelle Obama every year from-the<sub>weak</sub> President a  
*Rose zum Valentinstag bekommen.*  
 rose to-the<sub>weak</sub> Valentine’s day gotten

‘Since 1995, Michelle Obama has gotten a rose from the president for Valentine’s day every year.’

*The<sub>weak</sub> linguist/philosopher* has to be interpreted independently from the domains of quantification of the universal quantifier in order for the uniqueness requirement of the definite to be met. And *the President* has to be interpreted relative to a contextual

<sup>41</sup> Note that the examples from Schwarz (2009), which had the format of donkey sentences, were adapted here to match Chierchia’s example in that they have a syntactic binding configuration. Parallel points can be made with the donkey versions, but that involves additional issues with respect to the analysis of donkey sentences that we don’t need to get into here.

<sup>42</sup> If it does have one, it can covary with those as well, of course, with the  $\Sigma$ -binder in the appropriate place.

<sup>43</sup> Furthermore, weak article definites allow for transparent interpretations, which also requires the presence of a situation pronoun.

situation within the present presidential term, rather than the situations quantified over by *every year*, since we don't understand (59) to claim that Bill Clinton and George Bush gave Michelle Obama roses for Valentine's day prior to 2009.

Starting from the assumption of making *C*-variables responsible for the covarying bridging interpretation in (57), we now seem to be forced to accept that there is another device that can give rise to domain restriction effects, namely the situation pronouns of the system in section 2.3. But as I argued in section 3.2, situation pronouns suffice to account for the standard range of domain restriction effects with DPs. We thus have a highly redundant system, with two devices that can do almost the same things. Almost, since the situation pronoun apparently does not make possible the sort of bridging in (57).<sup>44</sup> Does this example then justify positing a *C*-variable in strong article definites? Schwarz (2009) argues that it doesn't, based on yet another contrast related to (54a).

As it turns out, the fact that *author* is a relational noun is crucial for (57) to work out. If we replace it with the non-relational noun *novelist*, the sentence becomes odd, because the covarying reading is no longer available.<sup>45</sup>

- (60) # *Jeder Roman, den Peter gekauft hat, war ihm aufgefallen, weil er schon einmal eine Kurzgeschichte von dem Schriftsteller gelesen hatte.*  
 Every novel that Peter bought has was him noticed because he  
*schon einmal eine Kurzgeschichte von dem Schriftsteller gelesen hatte.*  
 already once a short story by the<sub>strong</sub> novelist read had  
 'Every novel that Peter bought had come to his attention because he had already once read a short story by the novelist.'

The same contrast arises in (61):<sup>46</sup>

<sup>44</sup> It actually does, in the right context that allows for the right type of association of authors and book situations:

- i. a. **Context:** We're at an 'author's book fair', where authors promote their own books. Each author has his own book stand with his latest book on display, and stands behind the book himself.  
 b. *An jedem Buchstand, an dem Hans den Klappentext des Buches las, wurde er vom Autor in ein Gespräch verwickelt.*  
 At every bookstand at which Hans the blurb the<sub>GEN</sub> book read was  
 he by-the<sub>weak</sub> author in a conversation drawn  
 'At every bookstand at which Hans read the blurb of the book, he was drawn into a conversation by the author.'

(Schwarz, 2009)

Schwarz analyses this case using a suitable matching function of the type introduced in section 3.2.3. The apparent unavailability of the covarying interpretation in (57) is due to the matching function's need for contextual support.

<sup>45</sup> The 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. ✓ Der Autor von dem Buch  
 the author of the book  
 ii. # Der Schriftsteller von dem Buch/Roman  
 the novelist of the book

<sup>46</sup> We can again use *of*-possessives to support the contrast in relationality:

- (61) *Jedes Gemälde, das Hans in einem Museum besonders gefällt, inspiriert ihn dazu, sich eine Biografie von dem Maler / #Künstler zu kaufen.*  
 PART REFL a museum especially likes inspires him  
 a biography of the<sub>strong</sub> painter / artist to buy  
 ‘Every painting that Hans really likes in a museum inspires him to buy a biography of the painter / artist.’

Finally, if we make *author* non-relational by filling its relatum argument inside of a compound, the covarying reading also disappears:<sup>47</sup>

- (62) *# Jeder Artikel für den Kurs über Vorschulliteratur veranlasste den Studenten, im Internet ein Foto von dem Kinderbuchautor zu finden.*  
 every article for the class on pre-school-literature cause the  
 student on-the Internet a picture of the<sub>strong</sub> children’s book author to  
 find  
 ‘Every article for the class on literature for pre-schoolers caused the student to find a picture of the children’s book author on the internet.’

None of these facts are what we’d expect if the covarying interpretation of *author* in (54a) and (57) is made possible by the presence of a *C*-variable with a relation like  $\lambda x.\lambda y.y$  wrote  $x$  as its value, as such a value should be just as available for (60) and (62) (and, *mutatis mutandi*, for (61)). The relation introduced by the noun seems to play a direct role in creating the bridging effect. Extending his general anaphoric analysis of the strong article in (63b) (which, apart from the situation pronoun (which is again needed for transparent interpretations), is essentially parallel to Elbourne’s (2005) proposal, where anaphoric indices are introduced to account for syntactically bound definites.<sup>48</sup>),

- (63) a. [ $i$  [[the<sub>strong</sub>  $s$ ] man]]  
 b. [[the<sub>strong</sub>] <sup>$g$</sup>  :  $\langle s, \langle \langle e, st \rangle, \langle e, e \rangle \rangle \rangle$   
 $= \lambda s_r \lambda P. \lambda z. ix[P(x)(s_r) \ \& \ x = z]$

(Schwarz, 2009) proposes a variant of the strong article that takes the relation denoted by a noun like *author* as its argument, and lets the anaphoric index introduced

- 
- i. *der Maler von dem Bild*  
 the painter of the picture  
 ii. *# der Künstler von dem Bild*  
 the artist of the picture

<sup>47</sup> Once more, see the contrast in *of*-possessives:

- i. ✓ *Der Autor von dem Artikel*  
 the author of the article  
 ii. # *Der Kinderbuchautor von dem Artikel*  
 the children’s book author of the article

<sup>48</sup> It is also essentially the same as Fox’s (2002) analysis of the interpretation of traces within a copy theory of movement.

by the article fill the relatum slot, rather than identifying it with the referent of the definite.<sup>49</sup>

- (64) a.  $[i \text{ [[the}_{strong} s] \text{ author}]]$   
 b.  $[[the_{strong}] : \langle s, \langle \langle e, est \rangle, \langle e, e \rangle \rangle \rangle$   
 $= \lambda s_r \lambda R. \lambda z. \iota x [R(y)(x)(s_r) \ \& \ y = z]$

Once the noun provides the relation crucial for the bridging effect, no  $C$ -variable is required any longer, of course. The picture we have ended up with essentially divorces the machinery for capturing domain restriction (situation pronouns) from that responsible for encoding anaphoric relations. The contrast between the German articles in the bridging data, as well as the data on the role of relational nouns in bridging with the strong article, strongly support such a view. A  $C$ -variable account cannot capture the distinctions that are required by this broader empirical picture. An account in which only  $C$ -variables can be made responsible for bridging interpretations of definites over-generates, in that it predicts bridging interpretations to be available which in fact are not.

#### 4.4 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 Covariation and Possessives: Reassessing Elbourne’s ‘Argument from Binding’

Elbourne (2008) offers an interesting argument aimed at distinguishing different theories of domain restriction, which is based on a contrast in binding data between definite descriptions and Saxon Genitives. The crucial pair of examples is the following:

- (65) a. John fed no cat of Mary’s before the cat of Mary’s was bathed.

<sup>49</sup> Note that the contrast between the weak and the strong article forces us to introduce the anaphoric index with the determiner. If the relatum slot were filled by an anaphoric index inside of the NP proper, we no longer rule out the weak article in (57).



- b. #John fed no cat of Mary's before Mary's cat was bathed.  
(Elbourne, 2008, p. 100-101)

Elbourne argues that (65a), while perhaps somewhat marked stylistically, has a covarying interpretation, equivalent to having *the cat of Mary's* replaced by the pronoun *it* with a syntactically bound interpretation.<sup>50</sup> (65b), on the other hand, does not have such an interpretation, and because a quantifier like *no cat of Mary's* seems to require Mary to have multiple cats, it has no sensible interpretation at all. Elbourne uses this to argue in favor of placing *C*-variables on the determiner, rather than the noun. The former allows the availability of *C*-variables to vary with determiners, so that the contrast above can be captured by assuming that the possessive in (65b) does not contain a *C*-variable, whose individual index could be bound, while the definite in (65a) does (Elbourne uses *R pro* to represent the complex *C*variable).<sup>51</sup>

- (66) a. [<sub>DP</sub> [the [*R pro*]] [<sub>NP</sub> cat of Mary's]]  
b. [<sub>DP</sub> Mary's cat]<sup>52</sup> (Elbourne, 2008, p. 101)

Elbourne also uses the contrast to leverage an argument against situation based accounts of domain restriction. He suggests that, on such accounts, the covarying interpretation of (65a) could plausibly be attributed to the situation variable being bound. But if that were so, then the same covarying reading should be available for (65b), since it, too, would presumably contain such a situation variable.

Let me unpack this point a bit in light of the present framework. First of all, note that the presence of a situation **pronoun** is not necessary in order for either *the cat of Mary's* or *Mary's cat* to receive a covarying interpretation in any system in which *no* introduces quantification over situations. As soon as we assume that noun phrases have a semantic argument slot for situations, i.e., that they denote properties (as opposed to sets of individuals) in a situation semantic framework, occurrences of DPs in the scope of a quantifier over situations are predicted to have covarying readings. If the DP in question has a situation pronoun inside of it, that requires insertion of a  $\Sigma$ -operator below the relevant quantifier over situations. If it doesn't, then the covarying interpretation is what is derived by default (and in fact is the only option).<sup>53</sup> Note that the system in Elbourne (2005) makes exactly the same prediction (see in particular, pp. 59-64, for related discussion of problematic covarying readings of definite descriptions). As far as I can see, any account that handles donkey sentences in general in terms of quantification over situations will run into this problem. Which of course doesn't solve

<sup>50</sup> Speakers' judgment on the acceptability of (65a) seem to vary somewhat, and many, if not all, speakers prefer a variant with *that* replacing *the*.

<sup>51</sup> He also uses this contrast to argue against pragmatic enrichment approaches to domain restriction, which couldn't account for differences across lexical items in this way, since they don't assume any syntactic representation of domain restriction.

<sup>52</sup> On p. 102, Elbourne advocates a variant where Saxon genitives do come with a domain restriction variable (motivated by the fact that they have 'improper' uses), but where the individual argument is filled by the possessor:

i. [<sub>DP</sub> [THE[*R* Mary]]cat]

<sup>53</sup> This latter option requires the type of a definite to be  $\langle s, e \rangle$ , as in Elbourne's (2005) system. Otherwise, the semantic situation argument on the nominal predicate would not be assigned a value, or at least couldn't be assigned a sensible one, let alone a covarying one in cases where that is needed.

the problem, but it goes to show that its scope might be much broader. I'll return to this momentarily.

Elbourne considers the possibility of placing a situation pronoun (although he doesn't use that term) on the determiner, along the lines sketched above, which would seem to allow for the possibility of determiners varying in terms of whether or not they take such a pronoun as an argument.<sup>54</sup> While I think that allowing determiners to vary in that regard is indeed well motivated, it doesn't solve the problem at hand. A DP without a situation pronoun would still contain a noun phrase with a semantic situation argument, and as I just made clear, in the absence of a situation pronoun, such a situation argument will automatically wind up being bound in the scope of a quantifier over situations.

Should we see the contrast in (66) as an argument against situation semantic approaches, then? I don't think so. For we should first examine the empirical picture a bit more carefully. First, note that the same contrast seems to arise in donkey sentences:

- (67) a. If Bill fed one of Mary's cats, the cat of Mary's will be happy.<sup>55</sup>  
 b. # If Bill fed one of Mary's cats, Mary's cat will be happy.

Unless we are willing to assume that the covarying reading of the definite in (67a) is due to a (dynamically) bound index, contrary to situation semantic accounts of donkey sentences, Elbourne's (2008) explanation of the contrast between (65a) and (65b) won't apply here. But surely a unified account of the two cases would be preferable, since it seems like the very same phenomenon.

However, is it generally true that possessives can't have covarying readings? No, as the following variants of donkey sentences with possessives show:

- (68) a. If John drives a new car to a class reunion, his car will impress Sue.  
 b. Every farmer who owns a donkey gives his donkey lots of hay.<sup>56</sup>

<sup>54</sup> Elbourne dismisses this possibility on the grounds that Saxon genitives allow for 'incomplete' uses, which requires domain restriction. I wouldn't take this to be a knock-out argument. In the system developed above, for example, a DP without a situation pronoun can still exhibit domain restriction effects, mediated by the topic situation. What DPs without situation pronouns do lack is the capacity to be interpreted relative to a situation different from the rest of their clause, which is necessary for certain types of domain restriction effects, as well as transparent interpretations. Since I dismiss the contrast below, I won't pursue this further.

<sup>55</sup> There may be a preference for *that* over *the* here. However, the marked status of (67b) remains (even if some speakers don't find (67a) completely acceptable) and is unexpected on a situation semantic approach. More importantly, we will see shortly that there are covarying readings with possessives, which shows that there is no general constraint against these readings for either definites or possessives. Finally, note that the contrast remains in the following variant, where the multiplicity of Mary's cats is asserted separately, which seems to greatly improve the felicity of *the* in the consequent:

- (i) Mary has many cats.  
 a. If Bill fed a cat of Mary's, the cat of Mary's will be happy.  
 b. # If Bill fed a cat of Mary's, Mary's cat will be happy.

<sup>56</sup> It's worth noting that we seem to have a stronger sense of a uniqueness requirement relativized to the farmers (i.e., each farmer can only have one donkey) than in typical donkey sentences with pronouns. It's possible that this is related to the lack of a covarying interpretation in (65b), but I won't pursue this here any further.

The following examples, which most plausibly could be seen as working in a manner completely parallel to the German bridging example in (56) above, also displays a covarying interpretation of a Saxon genitive, and can again be captured in terms of covariation in terms of situations:

- (69) Whenever Bill and John went on a double date, John's date was better looking.  
 (70) Every marriage of Bills ended with his wife trying to get lots of money from him.

All of these examples with possessives clearly have a covarying interpretations. So whatever story we want to tell about the lack of a covarying reading in (67b) better not involve an absolute constraint against covarying readings with Saxon genitives.

Assuming that the absence of covarying readings in (67b) and Elbourne's original (65b), involving syntactic binding, is due to the same cause, parallel concerns would seem to apply to the latter type of example. In fact, I submit that Saxon genitives in a syntactic binding configuration can exhibit covarying readings as well:

- (71) a. Sue testified for every friend of hers from college that she had never seen her friend take any drugs.  
 b. The butler assumed for every one of Mary's husbands that Mary would eventually have a falling out with her husband's mother.

The Saxon genitives here seem to allow for a covarying interpretation. But if they do, then the original contrast on which Elbourne based his argument is not a general one. What exactly is responsible for making the covarying interpretation of Saxon genitives available in some examples but not in others remains an interesting and important question. But I will leave attempts at answering that question for future work. For the present discussion, the main point is that Saxon genitives do not provide an argument against situation-based accounts of domain restriction.

## 6 Conclusion and Further Issues

### 6.1 Taking Stock

I began this paper by laying out the basic motivations for and a technical implementation of a situation semantic system using situation pronouns inside of DPs. I then spelled out how such a system can account for the main phenomena relating to domain restriction in noun phrases, utilizing three possible configurations in which situation pronouns can appear: free, bound by an embedding operator that involves quantification over situations, or bound to be identified with the topic situation. I then compared this account with a more standard account of domain restriction using *C*-variables. First, I reviewed what I dubbed the location problem of *C*-variable accounts, where we have conflicting evidence as to where inside of the syntactic structure of the DP domain restriction variables are introduced. No similar problem arises for the situation semantic version. Next, I provided a novel empirical argument in favor of the situational account based on two types of definite articles in German and a contrast between them in certain types of bridging. *C*-variable accounts face a problem of overgeneration in light of these data, whereas the situation pronoun account can capture the facts more

appropriately (though it has to be paired with the assumption that there can be silent pronouns, providing an individual index that can be bound, inside of DPs). Finally, I considered an argument by Elbourne (2008) against situational accounts of domain restriction, based on a contrast between Saxon genitives and definite descriptions. I argued that the case he makes cannot be maintained, as the contrast is not a general one - there are covarying interpretations of Saxon genitive which undermine the empirical basis of Elbourne's argument. Together with the general conceptual advantage of a situation-based account, which captures the relevant domain restriction phenomena by means of independently motivated mechanisms, these considerations provide a compelling case in favor of an account along the lines proposed here. In this last section, I will point to some possible extensions and further issues that remain for more thorough investigation in future work.

## 6.2 Domain Restriction and Weak Quantifiers

In section 2.3, I considered two possible structures where DPs. In one, situation pronouns were introduced as arguments of determiners, in the other, they were arguments of nouns (or noun phrases). Building on Musan (1995) and Keshet (2010), Schwarz (2011) argues for the first option, based in part on the observation that weak quantifiers do not exhibit intensional independence, which can be captured straightforwardly if they do not contain a situation pronoun. Assuming such a system and the role of situation pronouns for domain restriction argued for above, a natural issue to explore is how the absence of situation pronouns in weak noun phrases affects the domain restriction options of such noun phrases. There is a straightforward prediction, here, namely that weak noun phrases are expected to be more limited in terms of their domain restriction options. In particular, noun phrases without a situation pronoun give rise to the equivalent of locally bound interpretations of such a pronoun.

The notion that weak quantifiers do not exhibit the same behavior as strong ones with respect to domain restriction is, of course, by no means new. Etxeberria (2005), Etxeberria and Giannakidou (2009), and Etxeberria (2006), for example, discuss interesting data from Basque, Greek, and other languages that directly relates to this. Furthermore, in a system like that of Landman (2004), where weak quantifiers are seen as denoting properties (or sets, in extensional versions), as much is assumed, since there is no quantifier proper to begin with. The present account contributes yet another dimension to this discussion, as it makes it possible to allow for variation between determiners (if the weak ones indeed are determiners<sup>57</sup>) in whether or not they take a situation pronoun as an argument. The additional link to the (un-)availability of transparent interpretations lends particular appeal to the account, since it captures the correlation between these otherwise disjoint phenomena through one and the same mechanism.

What exactly are the predictions for weak noun phrases, then? In simple declarative sentences without a modal, they have to be interpreted relative to the topic situation; in the scope of quantificational expressions, we expect covarying readings (and only covarying readings). So the account does not predict that there are no domain restriction effects with them whatsoever. The prediction simply is that they cannot be

<sup>57</sup> Note that the present accounts in principle leaves open both a determiner analysis of weak determiners and a Landman-style predicate analysis.

interpreted relative to a contextually salient situation (distinct from the topic situation or the situation quantified over). Testing these prediction empirically is no small feat, but I offer the following as a first piece of supporting evidence:

- (72) *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 to see who was there.

You: So what did you see when you checked who's in the audience?

Me: Well,

- a. there were exactly three students in attendance.  
(# ... in addition to 2 others from other classes)
- b. exactly three (of the) students were in attendance.  
(✓ ... in addition to 2 others from other classes)
- c. there was not a single student to be found.  
(# ... though plenty of other people's students had shown up)
- d. not a single (one of the) student(s) was to be found.  
(✓ ... though plenty of other people's students had shown up)

First, consider a scenario where a total of five students are in the audience, three of which are in my class. I believe that I could have spoken truthfully by uttering (72-b), but not by uttering (72-a). If the topic situation is determined by the question (as has been argued by Schwarz, 2009, following a suggestion by Angelika Kratzer), this is as expected. The weak DP in (72-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 (72-b), on the other hand, makes it possible to evaluate the nominal predicate relative to the contextually salient situation of students in my class, and under that interpretation, the sentence is true. If we change the scenario minimally so that none of my students (but several other students) showed up, the same contrast seems to be present for (72-c) and (72-d). While the issue warrants further investigation, this example thus at least provides a first piece of evidence supporting the prediction under consideration.

Another test case for the prediction that the situation pronoun account makes for weak quantifiers is that they should not have a contextual interpretation when occurring in the scope of a quantifier over situations. Take the following two examples:

- (73) a. In every town, there was a pastor that tried to raise funds to renovate old churches.  
b. In every town, a pastor tried to raise funds to renovate old churches.

Intuitively speaking, (73b) seems to display a scopal ambiguity, whereas (73a) only has a surface scope reading (with different pastors for different towns). One possible analysis of the interpretation where the indefinite takes wide-scope in (73b) is that there is LF-movement. But the equivalent of a wide-scope interpretation can also come about if we assume that there is an (optional) situation pronoun in the DP *a pastor* in this configuration, and that the value this pronoun is assigned by the context is a situation that contains a single pastor (this is, essentially, a situation pronoun variant

of the proposal in Schwarzschild, 2002). This interpretation is not for (73a), which is straightforwardly explained if the existential construction forces a weak interpretation of the indefinite, which does not contain a situation pronoun. The indefinite then has to be interpreted in (extensions of) situations containing the relevant town, which furthermore may be related to the town by a contextually supplied matching function. The most natural choice here would seem to be a function that connects different towns to different pastors, yielding the equivalent of a narrow scope reading.<sup>58</sup>

There's two related points that I'd like to touch on briefly. First, we have seen both here and in previous discussions that covarying interpretations of contextual domains in the scope of other quantificational operators are the default for noun phrases that do not have a situation pronoun inside of them. What this means is that the original argument from binding, made by von Stechow (1994) and Stanley and Szabo (2000), does not apply to situation semantic accounts of domain restriction, at least not in its simplest form. Assuming that the relevant operator involves quantification over situations, no situation pronoun is necessary in order for a covarying interpretation of the situation variable of the predicate in the embedded quantifier.<sup>59</sup>

Secondly, the distinction between strong and weak quantifiers in terms of whether or not they contain a situation pronoun provides an argument against pragmatic enrichment approaches to domain restriction, i.e., approaches that account for domain restriction effects without positing any syntactically represented variables. The argument here is completely parallel to that made by Elbourne (2008), based on the contrast between possessives and definites discussed above. But since I argued against the generality of that contrast, it is very much worth noting that a parallel argument against pragmatic enrichment approaches can be made based on the variation between determiners in terms of whether or not they take a situation pronoun as a complement.

### 6.3 Beyond Noun Phrases

The present discussion has focused on domain restriction phenomena in noun phrases and the various interpretative options for situation pronouns. The fact that one of the options involves topic situations suggests that we should explore further extensions of the account to phenomena that go beyond issues relating to noun phrases alone. An example that nicely illustrates the effects of the topic situation on domain restriction is the following variation of an example from Neale (2004, p. 130):<sup>60</sup>

- (74) a. Is there any ice in the house?  
 b. Yes, there's an ice-tray in the freezer.

The topic situation, seen as the situation exemplifying the question extension (see Kratzer, 2007; Schwarz, 2009, for details), could be characterized as follows:

<sup>58</sup> But note that there could, in principle, also be a matching function that happens to map all towns to the same pastor, so the wide-scope reading may not be completely ruled out.

<sup>59</sup> This holds, at least for cases where there is no intervening other quantifier. Cases involving covariation with higher quantifiers complicate the picture.

<sup>60</sup> Neale's original example, set in a context where someone asks for a beer, is *There's a bottle in the fridge*. Kratzer (Ms., 2008) argues convincingly that the implicit restriction of *bottle* to mean *bottle of beer* is due to syntactic NP-ellipsis.

- (75)  $s_{topic} = \iota s.EX(\{s' | \text{the truth-value of } \textit{there is ice in the house} \text{ is the same in } s' \text{ as in } s_{topic_Q}\})(s) \ \& \ s \leq w_0$   
 (where  $s_{topic_Q}$  is the topic situation relative to which the question is interpreted)

The answer in (74) consists of two parts. The affirmative response *yes* informs the hearer that the proposition that there is ice in the house is true in the topic situation. The most plausible interpretation of the second part, *there's an ice-tray in the freezer*, is that it is an elaboration intended to help the questioner with his search for ice by informing him about the locational properties of the topic situation. In other words, *an ice-tray* is understood as *an ice-tray filled with ice*. But the literal meaning expressed is simply that there is an ice-tray (which may or may not be filled with ice). We can capture the more restricted interpretation if we understand the second part to be a claim about the topic situation, which therefore results in (74b) being a claim about the situation exemplifying the proposition that there is ice in the house.<sup>61</sup>

Needless to say, much more needs to be said both about this example as well as the wealth of further issues relating to domain restriction in the broader discussion under labels such as ‘unarticulated constituents’, implicature, and explicature, as well as other phenomena that *C*-variables have been utilized to account for (see, for example Stanley, 2007). What I hope to have achieved here is to convince readers that using situation pronouns to account for domain restriction in noun phrases is the most parsimonious and empirically adequate option, and that further extensions to other related phenomena are worth exploring, to say the least.

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<sup>61</sup> A full analysis of this example has to address at least one further complication, namely that, strictly speaking, the ice-tray is not part of the situation exemplifying the question extension, which only contains ice. Perhaps we need to say something general about containers of substances. The problem seems similar to some of the issues concerning larger situation uses, as discussed by Schwarz (2009, Chapter 5).

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