An Anaphoric Account of Stage-Level Predicates

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1. Introduction*

This paper presents evidence that discourse anaphora can be introduced by stage-level predicates but not by individual-level predicates. A dynamic account is developed which draws on unexplored assumptions in Kratzer's (1989) proposal, in particular that the difference between individual- and stage-level predicates is a type-theoretic one. This type-theoretic difference provides the added benefit of resolving a compositionality puzzle involving perceptual reports and augmented absolute adjuncts.

2. Background

The distinction between individual- and stage-level predicates (hereafter ILPs and SLPs) is evident in a wide variety of English sentence types. The existential construction in (1) and (2) (Milsark 1974) and perceptual reports in (3) and (4) show a contrast in grammaticality:

(1) a. There were people sick.
b. There were people drunk.
c. There were doors open.

(2) a. *There were people intelligent.
b. *There were people tall.
c. *There were doors wooden.

(3) a. Martha saw a policemen available.
b. I saw Sam tower over his friends.

(4) a. *Martha saw a policemen intelligent.
b. *I saw Sam taller than his friends.

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The examples in (1) and (3) contain SLPs and are grammatical; (2) and (4) contain ILPs and are ungrammatical. Indefinite subjects also show a contrast in acceptability (Milsark 1974). The SLPs in (5) are grammatical, and the ILPs in (6) are less acceptable:

(5) a. Sm people were sick.
b. A man was drunk.

(6) a. ??Sm people were tall. (cf. Some of the people were tall.)
b. ??A man was intelligent. (cf. All men were intelligent.)

Bare plural subjects (Carlson 1977), shown in (7), and the free and absolute adjuncts in (8-13) (Stump 1985) show a contrast in interpretation between ILPs and SLPs:

(7) a. People were clever in those days.
G_x[person(x)] [clever(x)]
b. People were hungry.
$\exists x$[person(x) & hungry(x)] or G_x[person(x)] [hungry(x)]

As seen above, only SLPs allow a bare plural subject to have an existential interpretation. (8) and (9) are examples of free adjuncts. The first member of each pair has a SLP in the adjunct, and a kind of conditional interpretation is possible. This interpretation is not possible with the ILPs in the second member of each pair:

(8) a. Standing on a chair, Lisa's head touches the ceiling.
b. Having long legs, Lisa's head touches the ceiling.

(9) a. Standing on a chair, John can touch the ceiling
b. Having unusually long arms, John can touch the ceiling.

The examples below contain augmented absolute adjuncts, as Stump (1985) called them. (10) and (11) contain SLPs and the conditional interpretation is possible, but (12) and (13) contain ILPs in the adjunct, and no conditional interpretation is possible:

(10) a. With her hair braided, Jane reminds us of Mary.
b. With her children asleep, Mary watches TV.
c. With his work done, John goes straight to bed.

(11) a. With the truck in first gear, we would coast gently downhill.
b. With her hair braided, Jane must resemble Mary.
c. With the children asleep, Mary might watch TV.

(12) a. With his mother being a doctor, John knows the way to the Med Center.
b. With the water being a little cold, the children stay on the beach.
c. With his arm being in a cast, Bill is not asked to participate.

(13) a. With his mother being a doctor, John would know the way to the Med Center.
b. With the water being a little cold, the children must stay on the beach.
c. With his arm being in a cast, Bill might not be asked to participate.

When adjuncts also show a contrast in interpretation (Carlson 1977, Farkas & Sugioka 1983, Kratzer 1989, de Hoop & de Swart 1989). Kratzer (1989) used (14b&c) to argue that (14a) is a violation of the prohibition against vacuous quantification shown in (15). The fact that (14d) is acceptable is taken as evidence that SLPs have an implicit argument that ILPs do not have.

(14) a. *When Mary knows French, she knows it well.
*G [knows (Mary, French)] [knows well (Mary, French)]
b. When a Moroccan knows French, she knows it well.
G_x[Moroccan(x) & knows (x, French)] [knows well (x, French)]
c. When Mary knows a foreign language, she knows it well.
G_x [foreign language(x) & knows (Mary, x)] [knows well (Mary,x)]
d. When Mary speaks French, she speaks it well.
G_l[speaks (Mary, French,l)] [speaks well (Mary, French, l)]
e. *When Mary speaks French, she knows it well.
*G_l[speaks (Mary, French)] [knows well (Mary, French)]

(15) Prohibition against vacuous quantification (Kratzer 1989)
For every quantifier Q, there must be a variable x such that Q binds an occurrence of x in both its restrictive clause and its nuclear scope.

Thus, Kratzer proposes the interpretations in (16b) and (17b) for the sentences in (16a) and (17a).

(16) a. Manon is dancing.
b. dancing(m, l)

(17) a. Manon is a dancer.
b. dancer (m)

Kratzer's analysis is built entirely around a syntactic theory of argument structure. SLPs have a spatiotemporal location as the external argument, forcing subjects of SLPs to be VP-internal. The additional assumption that VP is the domain of existential closure allows this proposal to capture the basic facts about the interpretation of indefinite subjects very nicely.

Completely uninvestigated in Kratzer's paper are the type-theoretic consequences of positing the logical representations in (16) and (17). (18) and (19) show Kratzer's argument structures along with the logical type of the predicate classes:

(18)	Stage-level predicates	Argument structure	Type
	dance	<location, agent>	$\langle l,\langle e,t\rangle\rangle$
	hit	<location, agent, theme>	$\langle e,\langle l,\langle e,t\rangle\rangle\rangle$
(19)	Individual-level predicates		
	be intelligent	<experiencer>	$\langle e,t\rangle$
	own	<owner, owned>	$\langle e,\langle e,t\rangle\rangle$

This paper investigates some of the type-theoretic consequences of this proposal, focusing on the temporal portion of the *spatiotemporal* and ignoring the *spatio* part. I will show that this type-theoretic distinction can resolve a compositionality challenge posed by perceptual reports and absolute adjuncts and that the same basis for the ILP/SLP distinction can be used to provide an account of donkey anaphoric effects found with SLPs but not ILPs.

3. Nonuniformity

As I've argued elsewhere (Fernald in press), it is evident from the work of many researchers that the ILP/SLP distinction is due to several properties that overlap

substantially, but not perfectly. This paper focuses on one of those properties -- a correlation between SLPs and deictic and anaphoric uses of tense. The diagnostics for the ILP/SLP distinction are also affected by a plurality condition on generic quantification (see deHoop & de Swart 1989), issues of compositionality (Fernald in press), a specificity effect (Glasbey 1997, Fernald 1994, in press), coercion, and an inference of an interruption in the temporal interval over which an ILP is taken to hold of a subject (Schubert & Pelletier 1989, Krifka et al. 1995, Moens & Steedman 1988, Fernald 1994, 1996, in press). In addition, it may be affected by distinction between thetic and categorical judgments (see Ladusaw 1994, McNally 1998), and other factors.

4. The Deictic and Anaphoric Nature of SLPs

Donkey sentences are a classical problem in semantics. Problems arise if indefinite nominals are interpreted as having their own existential quantifiers within their basic interpretations, as assumed in Montague, for example. Thus, (20a) cannot be interpreted as (21a) since the variable *x* in the expression *beat (x,y)* cannot be bound by the existential quantifier; and both variables in *beat (x,y)* in (21b) are outside the scopes of the quantifiers. So the formulas in (21) are ill-formed, but if these variables were bound to any quantifiers with wider scope, incorrect interpretations would result.

(20) a. Every farmer who has a donkey beats it. (Geach 1962)
b. If a farmer has a donkey, he beats it.

(21) a. $*\forall y$ [farmer (y) & $\exists x$[donkey (x) & own (y,x)] $\rightarrow$ beat (y,x)]]
b. $*\exists y$ [farmer (y) & $\exists x$[donkey (x) & own (y,x)]]$\rightarrow$ beat (y,x)

Strawson (1952) pointed out that the *it* in (22) is understood as referring to whatever dog was introduced in the first sentence, but that interpreting *it* as an ordinary variable will result in it being unbound since the scope of the existential quantifier introduced by *a dog* is confined to the formula corresponding to the sentence in which that nominal appears:

(22) A dog came into the room. It flopped down. (Strawson 1952)
$\exists x$ [dog(x) & came-into-the-room (x)] flopped-down(x)

A rich tradition in dynamic Montague semantics (Groenendijk & Stockhof 1990) and discourse representation theory (Kamp 1981) has arisen to account for these and related phenomena. There are many varieties of dynamic semantics. For concreteness, my proposal will assume one of the earliest and most widely available versions, that of Groenendijk & Stockhof (1990).[1]

In Dynamic Semantics, utterances are interpreted as context change potential. In Dynamic Montague Grammar (DMG) this is formalized as a mapping from states to states, where a state is an assignment of values to discourse markers. Nominal expressions are interpreted using discourse markers rather than directly using variables. Lower case *d* indicates a discourse marker in the formulations below; *{x/d}* is called a state-switcher which has the effect of assigning the value *x* to a discourse marker *d*. The definitions of DMG that are crucial for this paper are shown in (23-29).

(23) Dynamic Existential Quantifier $\mathcal{E}d\Phi = \lambda p\ \exists x\ \{x/d\}(\Phi(p))$, where *x* and *p* have no free occurrences in Φ.

(24) Static Universal Quantifier $\mathcal{A}d\ \Phi = \sim\mathcal{E}d\sim\Phi$

[1] There are some well-known shortcomings to this system of assumptions -- see Chierchia (1992) for some of them. My proposal will naturally have the same shortcomings, but the purpose of this paper is to show that part of the analysis SLPs must involve the analysis of donkey anaphora.

(25) a. Uparrow $\uparrow\phi = \lambda p\,[\phi \wedge \check{}p]$, where ϕ is an expression of type *t*, *p* a variable of type $\langle s,t\rangle$ which has no free occurrences in ϕ.
b. Downarrow $\downarrow \Phi = \Phi$ (^**true**), where Φ is an expression of type $\langle\langle s,t\rangle,t\rangle$.

(26) Static Negation $\sim\Phi = \uparrow\neg\downarrow \Phi$

(27) Dynamic Conjunction $\Phi\,;\,\Psi = \lambda p\,[\Phi(\hat{}(\Psi\,(p))))]$, where *p* has no free occurrences in either Φ or Ψ.

(28) Sentence sequencing: $\phi\,.\,\psi$ is interpreted as $\phi'\,;\,\psi'$
Restrictive relative clauses: $\alpha_{CN} + \beta_s$ is interpreted as $\lambda x[\,\alpha'(x)\,;\,\beta']$

(29) A crucial property of state switchers: $\{\alpha/d\}(\beta(\gamma))$ is equivalent with $\{\alpha/d\}\beta(\{\alpha/d\}\gamma)$

Sample basic expressions are shown below:

(30) Basic expressions of DMG:

farmer	$\Rightarrow$	$\lambda x\ \uparrow$farmer (x)
walk	$\Rightarrow$	$\lambda x\ \uparrow$walk (x)
a_i	$\Rightarrow$	$\lambda P\,\lambda Q\,\mathcal{E}d_i\,[\check{}P(d_i)\,;\,\check{}Q(d_i)\,]$, where d_i is novel
$every_i$	$\Rightarrow$	$\lambda P\,\lambda Q\,\mathcal{A}d_i\,[\check{}P(d_i) \Rightarrow \check{}Q(d_i)\,]$
no_i	$\Rightarrow$	$\lambda P\,\lambda Q\,\mathcal{A}d_i\,[\check{}P(d_i) \Rightarrow \sim\check{}Q(d_i)\,]$
he_i	$\Rightarrow$	$\lambda Q[\check{}Q(d_i)\,]$, where d_i is familiar
$John_i$	$\Rightarrow$	$\lambda Q[\{j/d_i\}\check{}Q(d_i)\,]$

These assumptions yield (31b) as the interpretation of (31a). This formula is equivalent to (31c) and (31d).

(31) a. Every farmer who has a donkey beats it.

b. $\mathcal{A}d_1[[\uparrow$farmer $(d_1)\,;\,\mathcal{E}d_2[\,\uparrow$donkey $(d_2)\,;\,\uparrow$own $(d_2)(d_1)]]$
$\Rightarrow \uparrow$beat $(d_2)(d_1)]$

c. $\lambda p\ \forall x\ \forall y\ \{x/d_1\}\{y/d_2\}[$farmer (d_1) & $\exists$x[donkey (d_2) & own $(d_2)(d_1)]$
beat $(d_2)\,(d_1)] \wedge \check{}p]$

d. $\lambda p\ \forall x\ \forall y[$farmer (x) & $\exists x[$donkey (y) & own $(y)(x)]$
$\rightarrow$ beat $(y)\,(x)] \wedge \check{}p]$

To get the truth conditions for (31a), we can apply the downarrow operator to (31d). This will result in the tautologous proposition saturating the formula in (31d).

Partee (1989), summarizing Bauerle (1979), von Stechow (1982), Hinrichs (1981), Partee (1973), and Cooper (1986), points out that temporal and locative implicit arguments behave like overt pronouns in having deictic, discourse anaphoric, and bound variable characteristics. Thus:

(32) a. Deictic or demonstrative: Who's he? (Partee 1989)
b. Discourse anaphoric: A woman walked in. She sat down.
c. Bound variable: Every man believed he was right.

(33) a. Deictic past: I didn't turn off the stove. (Partee 1973)
b. Discourse anaphoric past: Mary woke up sometime in the night. She turned on the light.

c. "Bound variable" past: Whenever John wrote a letter to Mary, she answered two days later.

Partee concludes that tense is like a pronoun. Significantly, none of the examples in Partee's work or the others cited here involve ILPs. In fact, ILPs have none of these characteristics:

(34) a. Sam was smart.
b. Sam was a professor. He was altruistic.
c. *Whenever Sam was a professor, he was altruistic.

(34a) has a deictic use like (33a) only if the predicate is coerced into being stage-level through a pragmatic process I have elsewhere called Evidential Coercion[2] (see Fernald 1994, 1996, in press). On such a reading, *was smart* is taken to mean 'gave evidence at a spatiotemporal location of having the property denoted by the ILP *smart*'. But the uncoerced ILP reading of (34a) is not deictic in the way that (33a) is. Similarly, the uncoerced readings for the (34b) lack the discourse anaphoric reading possible with the SLPs in (33b). Finally, (34c) has the same status as (33c). These sentences usually appear in the literature with an ungrammaticality star before them, although I usually think this is a bit too strong. I take it, however, that to the extent that (34c) is acceptable, it is not quantifying over event time, but the time at which the proposition in each clause is to be evaluated.[3] All the sentences in (34) have tense in them, but they lack the similarity to pronouns of the examples in (33) which contain SLPs. We conclude that tense is not anaphoric or deictic except when it appears with SLPs. Dynamic semantics was designed to deal with cases of discourse and bound variable anaphora like (33b&c). Thus, an analysis needs to be developed in which SLPs have dynamically-interpreted implicit arguments.

A significant consequence of this analysis will be that the implicit temporal arguments will be expected to pattern exactly with donkey anaphora. This prediction appears to be successful:

(35) a. When a woman$_i$ speaks$_t$ French, she$_i$ speaks$_t$ it well. (Kratzer 1989)
b. A woman$_i$ woke$_t$ up sometime in the night. She$_i$ turned$_t$ on the light.
c. No one$_i$ walked in. *He$_i$ turned on the light.
d. No one walked$_t$ in. *Sam turned$_t$ on the light.
e. If a farmer$_i$ has a donkey, he$_i$ beats it. *He$_i$ is upset.
f. If a farmer has$_t$ a donkey, he beats$_t$ it. *Robin is upset$_t$ about this.

(35a) is a classical donkey sentence. (35b) shows that the implicit argument in the second sentence can pick up the discourse referent used in the first sentence. The temporal argument in the second sentence of (35c) cannot be interpreted as referring to locations of

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[2] Below is my statement of Evidential Coercion:
(i) Evidential Coercion: Let α be an ILP with interpretation α'. α can be used as a SLP with the following interpretation:
$\lambda l_j\, \lambda x \exists Q\, [Q(x,l_j)\ \&\ G_{y,l}(Q(y,l))[(\alpha'(y)]\ ]$
Other kinds of coercion are relevant to the ILP/SLP diagnostics as well. See Fernald (in press) for details.

[3] Tendencies to think that (34b) may involve a similar temporal reference I think also involve evaluation time rather than any coerced event time. I discuss this further in Fernald (in press), but there is room for further investigation.

walking in. This parallels the inability of the overt pronoun *he* in the second sentence of (35d) to pick up a referent from the first sentence.

Finally, consider the pair in (35e) and (35f). (35e) shows that, while the conditional connective is internally dynamic, it is externally static. That is, an indefinite description contained in the antecedent of a conditional introduces a discourse referent that can be picked up by an expression in the consequent (hence the connective in dynamic within the sentence in which it appears); but the referent cannot be picked up by any pronoun in a subsequent sentence (contrasting with the simple case in (35b)). Now we see in (35f) that the temporal argument of SLPs works exactly the same way. (35f) is an acceptable discourse, but not on an interpretation in which Robin's being upset coincides with each instance of a farmer seeing and beating a donkey.

5. Proposal

From the discussion above, I conclude that a dynamic analysis is needed for SLPs. Since it is a consequence of Kratzer (1989) that SLPs and ILPs are of differing logical type, I will propose that the extra spatiotemporal argument of SLPs should be interpreted as a discourse marker the way pronouns are in dynamic semantics. In this analysis, I assume the type-theoretic distinction[4] shown in (36) and (37):

(36) Stage-level predicates

dance	$\langle l,\langle e,cc\rangle\rangle$
hit	$\langle e,\langle l,\langle e,cc\rangle\rangle\rangle$

(37) Individual-level predicates

be intelligent	$\langle e,cc\rangle$
own	$\langle e,\langle e,cc\rangle\rangle$

These are the types implicitly assumed in Kratzer's analysis shown in (18) and (19) but with *cc*, the type of propositions in dynamic semantics (mnemonic for 'context change' - see Chierchia 1992), in place of *t*.

Variable	Type	
x, y	*e*	
p	*cc*	
P, Q	$\langle s,\langle e,cc\rangle\rangle$	ILP
T, U	$\langle s,\langle l,\langle e,cc\rangle\rangle\rangle$	SLP
t, l	*l* (a sort of type e)	

I assume that times are a sort of entity and so can be values for temporal sorts of discourse markers without adding any machinery to DMG. I further assume that tense is what introduces a temporal discourse marker (indicated by d^t) that fills the extra argument position of SLPs. (38) and (39) illustrate this:

(38) Simple deictic past$_i$ $\Rightarrow \lambda T\, \lambda x[\check{}T(d^t_i)(x)\,;\, \lambda p\, \exists t_R\, [t_R < t_S \,\&\, d^t_i = t_R \,\&\, \check{}p]]$

[4] We could just as easily assume that *l* is the final argument to saturate the predicate and use $\langle e,\langle l,cc\rangle\rangle$ as the type for intransitive SLPs. A few of the rules of composition would differ, but the two approaches are about equally simple. The one I show here is slightly simpler.

(39) Simple anaphoric past$_i$ $\Rightarrow$

$\lambda T\, \lambda x[\check{}T(d^t_i)(x)$ & REL (d^t_j, d^t_i) ; $\lambda p\, \exists t_R\, [t_R < t_S$ & $d^t_i = t_R$ &$\check{}p]]$,

where d^t_i is novel and d^t_j is familiar.

In (38) and (39), t_S indicates speech time and is left free since it will be bound by context. The reference time t_R is bound by an existential quantifier. In illustrating this proposal, I assume that all tense and aspect information is available at a single syntactic node. Obviously there are complex issues involved in the composition of aspect and this proposal would ultimately need to be integrated into such a system.

In this proposal, any object argument of a SLP composes with the predicate's head as its first argument. Tense, if present, composes next, resulting in something of type <e,cc> which can then compose with the subject. Small clauses, like the perceptual reports shown in (3) and (4), contain no tense so an additional composition rule is needed to allow the subject and predicate to compose:

(40) Small Clause Composition

a. Syntax. If α is of type $\langle s,\langle\langle s,\langle e,cc\rangle\rangle,cc\rangle\rangle$ and δ is of type $\langle l,\langle e,cc\rangle\rangle$, then $f(\alpha,\delta)$ is of type $\langle l,cc\rangle$.

b. Semantics. If α is of type $\langle s,\langle\langle s,\langle e,cc\rangle\rangle,cc\rangle\rangle$ and δ is of type $\langle l,\langle e,cc\rangle\rangle$, and α and δ translate into α' and δ' respectively, then $f(\alpha,\delta)$ translates into $\lambda l\, [\alpha'\{\hat{}\delta'(l)\}]$.

This results in the following interpretation for *Robin saw John leave*:

(41) a. Robin saw John leave.

b. $\lambda p[see'(r, \lambda l[leave(l)(j)], d^t) \,\&\, \exists t_R\, [t_R < t_S \,\&\, d^t = t_R \,\&\, \check{}p]]$

In such expressions, the event time of the perceived event (described in the small clause) is inherited from the event time of perception in the matrix clause. The following meaning postulate accomplishes this:

(42) MP: For all α of type $\langle\langle l,cc\rangle,\langle l,\langle NP,cc\rangle\rangle\rangle$, β of type e, γ of type $\langle l,cc\rangle$, and δ of type e_l, interpreted as α', β', γ', and δ' respectively, $[\alpha'(\beta', \gamma', \delta') \Leftrightarrow \alpha_{\#}'(\beta', \gamma'(\delta'), \delta')]$.

The formula below is the result of applying the meaning postulate to (40b):

(43) $\lambda p[see'(r, leave_{\#}(d^t)(j), d^t) \,\&\, \exists t_R\, [t_R < t_S \,\&\, d^t = t_R \,\&\, \check{}p]]$

My proposal, then is that SLPs are descriptions of temporal intervals and that discourse markers are associated with those intervals. The discourse referent that the SLP picks up can be introduced by discourse context, accommodation, or a dynamic adverb of quantification. Not all SLPs in a discourse pick up exactly the same temporal referent. For example, in *Robin left the store, went home, and fell asleep*, there is at least an inference of a progression in event times. Hinrichs (1986) discusses these issues in detail, concluding with the following generalizations:

(44) The reference point of a discourse can be shifted by:
(a) the Aktionsart of a main clause; accomplishments and achievements introduce new reference points, while states, activities and events described in the progressive do not.
(b) the use of temporal conjunctions.
(c) the use of flexible anchoring adverbials and dependent adverbials.
(Hinrichs 1986)

Since SLPs can be either telic or atelic, the issue of shifting temporal reference is independent of the ILP/SLP issues. For this reason, my analysis finesses these issues using the relation *REL* in the interpretation of anaphoric past in (39). This is also the reason (39) includes two temporal discourse markers. Thus, SLPs combine the characteristic of a definite description, that picks up a previously established referent, with the ability of an indefinite to introduce a new referent.

So far I have not said much about tense with ILPs. Certainly ILPs occur in tensed clauses! I have claimed that tense is used to locate the event time of SLPs, but it cannot do the same thing for ILPs since ILPs, by assumption, do not have event time. Consistent with the discussion of (34) above, I propose that tense with ILPs serves to locate the time at which a propositional content of an utterence is to be evaluated. As before, I illustrate this with the simple past:

(45) Simple $past_{ILP} \Rightarrow$ $[\lambda P\, \lambda x[P\{x\}]]^{t_V} \& t_R = t_V \& t_R < t_S$

6. Consequences

The first consequence of this proposal is that we have an account of the donkey effects involving SLPs:

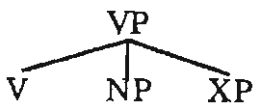
(46) a. A woman woke up. She turned on the light. (=33b)
b. λp [woman(x) & woke-up (d^t_1) (x) & $\exists t_R[t_R < t_S \& d^t_1 = t_R$
& turn-on-light (d^t_2) (x) & REL (d^t_1, d^t_2) & $\exists t_R[t_R < t_S \& d^t_2 = t_R \& \check{}p]]]$

The second consequence is that we can provide a way out of a problem for compositionality with perceptual reports and augmented absolutes. Carlson's (1977) account of the ILP/SLP distinction was based on sorting the set of entities into stages, objects, and kinds, with the sort *individual* consisting of the union of the object and kind sorts. His account is thus built on the type-theoretic distinction below:

(47) SLP : $\langle e^s, t\rangle$
ILP : $\langle e^i, t\rangle$

In Carlson (1977), perceptual reports are analyzed as having tripartite structures:

(48)

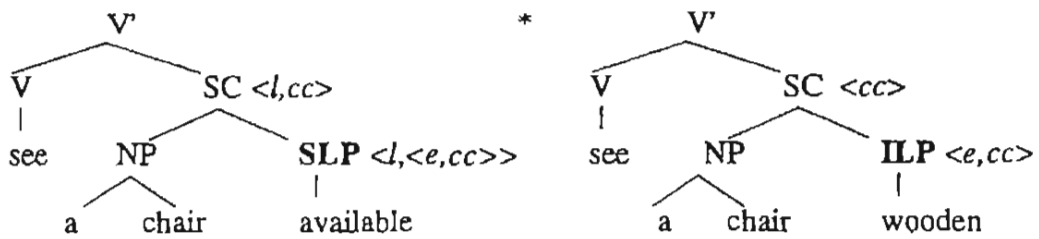


More recent work in syntax has argued that the NP and XP (the description of the perceived event) should be analyzed as a single constituent (Higginbotham 1983, Pollard & Sag 1994). But such an analysis is not possible with Carlson's type-assignment: it is easy to see that the distinction between ILPs and SLPs will be lost once the predicate composes with its subject argument.

The type-theoretic distinction assumed in this paper provides a solution to this. Since SLPs have an extra temporal argument, the type-theoretic distinction remains evident until tense supplies the discourse marker to fill it. We can provide the following type assignment to the perceptual report form of *see* and this allows it only to compose with small clauses that contain a SLP, as illustrated in (50):[5]

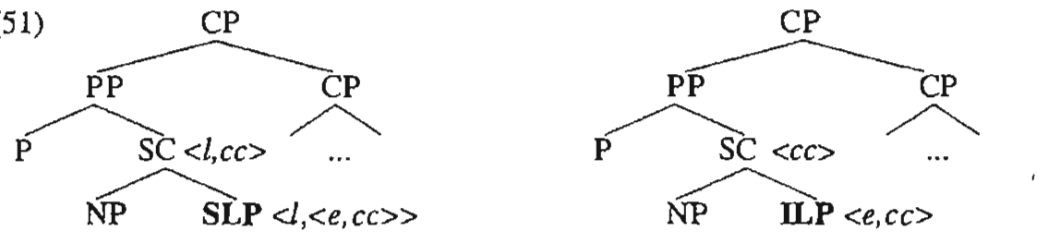
(49) *see* $\langle\langle l,cc\rangle,\langle l,\langle e,cc\rangle\rangle\rangle$

(50)



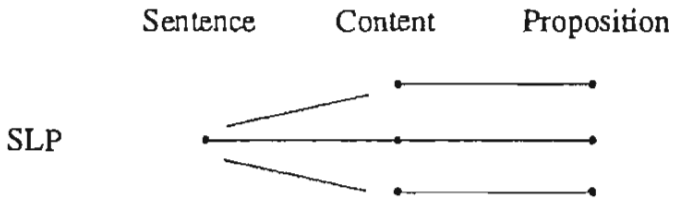
Although I do not provide an account of the interpretations of augmented absolutes here (see Fernald in press), it is clear that some way is needed to distinguish between PPs that contain ILPs from those that contain SLPs (recall the contrast in interpretation they show in (10-11) and (12-13)). My account provides such a mechanism:

(51)

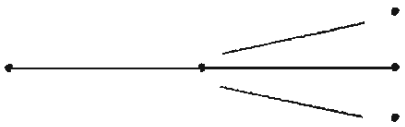


A final consequence of this proposal (also a consequence of Kratzer 1989) is that time is used differently in propositions based on SLPs than it is in propositions based on ILPs. This is because time is a constituent within any SLP-based proposition but not within an ILP-based proposition. The chart in (52) indicates that sentences containing SLPs and ILPs both potentially correspond to different propositions depending on the time at which the sentence is uttered. However, how the different propositions are gotten potentially differs in the two cases.

(52)



[5] A NELS participant pointed out that *see* can take a full clause complement (*Robin saw that the dishes had been washed / Robin saw that Pat was smart*) and so the type $\langle\langle l,cc\rangle,\langle e,cc\rangle\rangle$ must also be available for it. The *see* in this sentence clearly does not involve direct perception, unlike the uses of *see* we have been discussing. I assume that the two are distinguished from each other in the lexicon since the version of *see* that entails direct perception cannot be used with a full clause complement.

ILP 

I use the term *content* to pick out everything in a proposition except for its evaluation time. Since time is at issue within a SLP-based proposition, it must be fixed before the content is gotten. Thus, each SLP-based sentence potentially corresponds to multiple contents. For example, in identifying the content of the sentence *Robin kicked the trashcan* it is necessary to identify just what time the speaker is talking about. Once this content is established, which proposition is expressed is already determined. ILP-based sentences, on the other hand, do not have temporal arguments that need to be anchored before the content can be identified. Thus, *Robin is tall* expresses the same content regardless of when it is uttered. However, the time at which the content is evaluated yields multiple propositions for the single content: uttering the sentence sometime in 1998 expresses a different proposition from uttering it in 1990.

Finally, it should be evident if the event time argument in a SLP-based sentence is bound to an operator within the sentence, the result will have the temporal properties of ILP-based sentences. This is because the determination of the event time is not dependent on utterance context. Clearly there are consequences to this that deserve further attention.

7. Conclusion

In this paper, we have observed stage-level predicates exhibiting the characteristics of donkey anaphora. Although the donkey effects with atemporal *when* adjuncts have been discussed repeatedly in the literature, I am not aware of any previous claims that SLPs exhibit the full range of donkey effects. The analysis presented here was based on unexplored assumptions of Kratzer (1989) which are largely independent of the main thrust of that paper. My account assumes a type-theoretic distinction between ILPs and SLPs in which the extra temporal argument of SLPs is filled by a discourse marker. This analysis provided a solution to the compositionality puzzle posed by perceptual reports and augmented absolute adjuncts. Finally, I briefly explored the temporal consequences of positing the distinction proposed here.

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