ON THE RELATIVIZATION OF DP ADVERBS

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There are instances of spatio-temporal DPs that can be used as adverbs. McCawley (1988) proposes that these “DP adverbs” are instances of adverbial PPs, claiming that a phonetically zero adposition can be hypothesized right above certain types of spatio-temporal DPs. This paper is an attempt to provide another piece of evidence for the silent PP analysis of DP adverbs. This paper examines the relativization of DP adverbs in English and in Japanese under the Promotion Analysis, and shows that DP adverbs behave in much the same way as DPs which are relativized from within PP with an overt adposition. This paper also shows that with the R-pronoun where as a relativizer, any spatial DPs can be relativized in English. This indicates that unlike what is argued in Caponigro and Pearl (2008, 2009), where is not a DP adverb but “incorporates” some adposition.*

Keywords: DP adverbs, R-pronouns, Promotion Analysis, adposition stranding

1. Introduction

Some spatio-temporal nominal phrases in English can be used adverbially without spatio-temporal adpositions, as shown in (1).

(1) a. John arrived that day.
    b. You have lived some place warm and sunny.

(Larson (1985: 596–597))

The nominal phrases like that day or some place warm and sunny in (1) are known as “bare-NP adverbs” (Larson (1985)). Although the question as to how “bare” they are cannot be easily answered, we can at least say that

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they have a DP structure because they often involve determiners such as demonstratives. In this paper, these adverbial nominal phrases are referred to as DP adverbs.¹

There are two positions concerning the question of how DPs function as adverbials. One position is Larson (1985), which proposes that DP adverbs are inherently Case-marked nominals. The other maintains that they are PPs with covert adpositions (Bresnan and Grimshaw (1978), Emonds (1987) and McCawley (1988)).

Following McCawley (1988), this paper shows that the adverbial nature of DP adverbs is attributed to a silent adposition hypothesized right above the spatio-temporal DP (cf. Caponigro and Pearl (2008, 2009)).

(2) a. \[
\text{[PP } \emptyset \text{ P } [\text{DP that day}]]
\]

b. \[
\text{[PP } \emptyset \text{ P } [\text{DP some place warm and sunny}]]
\]

First, section 2 will present an overview of the observations in Larson (1985), McCawley (1988) and Haumann (2007). Larson (1985) shows that DP adverbs can be conjoined with other adverbial categories such as simplex lexical adverbs and adverbial PPs. On the other hand, McCawley (1988) and Haumann (2007) observe that DP adverbs cannot occur in the positions where PPs cannot occur. They claim that the parallel distribution of DP adverbs and adverbial PPs can be explained by the silent PP analysis. In section 3, we will provide another piece of evidence for the silent PP analysis by investigating the relativization of DP adverbs in English and in Japanese discussed in sections 3.1 and 3.2. In section 3.3, adopting the Promotion Analysis of relative clauses, we will show that the relativization of DP adverbs sometimes strands a phonetically null element to which the adverbial function of the DP adverbs is attributed. This leads us to conclude that DP adverbs have an invisible structure above DP, which is a PP structure with the silent adposition. The investigation of the relativization of DP adverbs also prompts us to look at the R-pronouns (van Riemsdijk (1978)) such as where in English, which are considered as bare DPs (Larson (1985)), or as DPs in the complement position of the silent adposition (Caponigro and Pearl (2008, 2009)). With the R-pronoun where as a relativizer, any spatial DPs can be relativized, indicating that where cannot be a DP adverb. Section 3.4 will claim that the R-pronoun where “incorporates” some overt adposition which occupies the lower head of a split PP structure (Koopman (2000), den Dikken (2010)). Section 4 is the conclusion.

¹ This paper adopts the DP Analysis (cf. Abney (1987)).
2. DP Adverbs

2.1. Types of DP Adverbs in English

The membership of the class of DP adverbs in a particular language is determined on lexical grounds. Larson (1985) observes that in English, DPs can occur without adpositions when they have common nouns denoting the temporal point as their lexical heads, as shown in (3a), and when they are “proper names for the temporal periods” as in (3b).

(3) a. John arrived [that {moment/minute/hour/day/week/month/year}].
   b. John arrived [{the previous April/March 12th/Sunday/the Tuesday that I saw Max}].

In addition, Larson (1985) notes “the only [DP] adverbs of location are those headed by the common noun place” (Larson (1985: 596)).

(4) You have lived [{some place warm and sunny/every place that Max has lived}].

According to Larson (1985), the spatio-temporal deictic proforms such as then, there, and here, which are called R-pronouns in van Riemsdijk (1978), are also instances of DP adverbs.

(5) a. John arrived [then].
   b. John lived [here/there].

Larson (1985) also states that DPs headed by temporal nouns which denote a time span, during which the event described in the sentence happens, cannot occur without adpositions, as shown in (6).

(6) a. John arrived {*(on) [that occasion]/*(during) [this vacation]}.  
   b. John stayed in New York {*(during) [that period of his life]/*(before) [that interval]}.  

Nor can other common spatial nouns or spatial proper names occur without adpositions, as shown in (7).

(7) a. You have lived *(at) [some {location/address/area} near here].  
   b. You have lived {*(on) [43rd St]/*(in) [Germany]}.  

As we will see in sections 3.3 and 3.4, these spatio-temporal DP adverbs are divided into two types: (i) spatio-temporal DPs such as those in (3) and (4), which are DPs in the complement position of a silent adposition, and (ii) R-pronouns such as those in (5), which are adverbials that incorporate an adposition.²

² Although the membership classes are lexically determined, it is worth noticing that the various temporal nominals expressing temporal point can function as a DP adverb, whereas the spatial nominals other than place cannot occur without adpositions in English.
2.2. Distribution of DP Adverbs

Let us briefly look at previous analyses concerning the syntactic category of DP adverbs. Bresnan and Grimshaw (1978) propose that the adverbial nominals are PPs in which the adposition selects the nominal phrase under the identity of a certain feature and is deleted when the value of the feature is [Temporal], [Locative], [Direction], or [Manner]. The deleted adposition is null at the surface structure. McCawley (1988) modifies Bresnan and Grimshaw’s (1978) silent PP analysis, claiming that the adverbial DPs are analyzed as objects of a silent adposition. On the other hand, Larson (1985) claims that the adverbial nominals are NPs, i.e. DPs in our present terminology. The feature of N optionally assigns Oblique Case to the phrase it projects when the value of the feature is [Temporal], [Locative], [Direction] or [Manner]. Larson also claims that an adverbial θ-role is assigned to a, where a is any phrase. DPs which are assigned an Oblique Case can occur as an adverbial phrase in the sentence if the adverbial θ-role is assigned to it. In this paper, the value of the feature, which allows Ns to be lexical heads of DP adverbs, is referred to as [F].

Larson (1985) observes that DP adverbs can be conjoined with other adverbial categories such as simplex adverbs and PPs, as shown in (8).

(8)  a. They will be arriving [Thursday] and/or [subsequently].
    b. The entire company will be arriving [at two o’clock] and/or [the next day].

(Larson (1985: 599))

Larson (1985) also observes that DP adverbs show a parallel distribution with simplex adverbs and PPs. DP adverbs can occur in the positions in which the occurrence of the adverbial category is obligatory, as shown in (9).

(9)  a. Peter {worded/phrased} the letter {*Ø/[tactlessly]/[in a thoughtful manner]/[that way]}.  
    b. Peter put the letter {*Ø/[in the mailbox]/[some place]}.  

(Larson (1985: 599))

McCawley (1988) observes that DP adverbs can occur in sentence-final position as shown in (10a), in which simplex adverbs can occur as shown in (10b).

(10)  a. Smith may have withdrawn his lawsuit \[DP_{adv} \text{ that day}\].  
    b. Smith may have withdrawn his lawsuit \[ADV \text{ subsequently}\].  

(McCawley (1988: 585))

As Haumann (2007) shows, PPs can also occur in the sentence-final position, as exemplified in (11).
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(11) The final axe is expected to come after Birt takes over as the new director general [PP in March]. (Haumann (2007: 266))

McCawley (1988) also observes that DP adverbs cannot occur in the mid-position of the sentence as shown in (12a), where simplex adverbs can occur as shown in (12b).

(12) a. *Smith may have [DPadv that day] withdrawn his lawsuit.  
    b. Smith may have [ADV subsequently] withdrawn his lawsuit.  
       (McCawley (1988: 585))

In the mid-position of the sentence, PPs are less than fully acceptable, or unacceptable, as shown in (13).

(13) a.??Smith may have [PP on a subsequent day] withdrawn his lawsuit.  
    b. *BT will [PP in March] begin to market Europe’s first international videophone …  
       (McCawley (1988: 585))  
       (Haumann (2007: 266))

McCawley (1988) claims that the examples in (12) and (13) constitute supporting evidence for the silent PP analysis of DP adverbs because the reason why DP adverbs cannot occur in the mid-position of the sentence would be the same as the reason why PPs cannot occur there. If DP adverbs did not have such an invisible PP structure, we would have to further assume that, for example, the inherent Oblique Case marking proposed in Larson (1985) is unavailable in the mid-position of the sentence.

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3 As noted in McCawley (1988) the status of Larson’s (1985) feature [F] and that of Bresnan and Grimshaw’s (1978) are alike: the membership of the Ns which bear the feature [F] is determined only lexically under either approach. “Whatever features an adherent of Larson’s (1985) analysis might take as responsible for the assignment of Case to a given NP, an adherent of a zero P analysis could take as allowing the NP to occur as the object of a zero P” (McCawley (1988: 588)). The only thing we can say is that the Ns with the lexical feature [F] are allowed to function as the head of a DP adverb, whereas those without [F] cannot.

4 Collins (2007) proposes that the non-pronunciation of the adposition follows from a general version of the Doubly-filled Comp Filter, which is a principle of UG. The non-pronunciation of the adposition is then accounted for if we assume overt raising of the spatio-temporal DP to the specifier position of the adpositional head.

We can point out two potential problems for Collins’ (2007) proposal. First, we have to account for why the filter always excludes the possibility of pronouncing the adpositional head. Second, we end up saying that the filter is applied only to the adpositional phrases which select DP whose lexical head N bears the feature [F] (and attracts it to the specifier position).
3. On Relativization of DP Adverbs in English and Japanese

This section provides an argument for the PP structure of DP adverbs based on the Promotion Analysis of the derivation of relative clauses. In sections 3.1 and 3.2, we will observe the difference between the relativization of DP adverbs and that of other spatio-temporal DPs in English and their counterparts in Japanese. In section 3.3, we will first discuss the derivation of ordinary gapped relative clauses under the Promotion Analysis, and then consider the relativization of DP adverbs and show that the silent adposition is stranded. In section 3.4, we will consider the status of the R-pronoun *where*, which is suggested as a bare DP, i.e. a DP adverb, in Larson (1985) and Caponigro and Pearl (2008, 2009).

3.1. Seemingly Gapless Relative Clauses and DP Adverbs in English

Larson (1985) observes that the lexical head N with the feature [F] of DP adverbs can be the head noun of a seemingly gapless relative clause, as shown in (14).

(14) a. the {time\[F]/moment\[F]/day\[F]/…} [(that) he left]
   b. the place\[F] [(that) he lives]

Larson (1985) also observes that the spatio-temporal N without [F], which cannot head a DP adverb, cannot be the head noun of such seemingly gapless clauses, as illustrated in (15).

(15) a. *the interval [(that) he left]
   b. *the bungalow [(that) he lives]

On the other hand, both Ns with [F] and Ns without [F] can be the head noun of gapped relative clauses.

(16) the {bungalow/place\[F]} [(that) he lives in e_i]

In (16), stranding of the overt adposition *in* yields the relative clause with a gap in the complement position of the adposition, allowing both Ns with [F] and Ns without [F] to be the head noun. Pied-piping of the overt adposition accompanied by the *wh*-relativizer *which* leaves a PP gap, as illustrated in (17), allowing both Ns with [F] and Ns without [F] to be the head noun.5

(17) a. the {interval/week} [(during which), he left e_i]
   b. the {bungalow/place} [(in which), he lives e_i]

So far we can say that only Ns with [F], which can be the lexical head

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5 Whether it can be stranded within the relative clause or not depends on the type of adposition used.
of a DP adverb, can be the head noun of the seemingly gapless relative clauses, while both Ns with [F] and Ns without [F] can be the head noun of the gapped relative clauses: the gap is of DP in (16), and it is of PP in (17). Notice that *in which* in (17b) can be replaced with the R-pronoun *where* as a spatial *wh*-relativizer, as shown in (18).

(18) the {bungalow/place[F]}i [wherei he lives]
The head noun of the relative clause in (18) can be either Ns with [F] or Ns without [F]. This indicates that the relative clause in (18) is gapped: the relativizer *where* in (18) leaves the gap of PP within the relative clause.

3.2. Seemingly Gapless Relative Clauses and DP Adverbs in Japanese

Spatio-temporal nominals in Japanese can also be modified by seemingly gapless clauses in a manner similar to the relative clauses in English shown in (14), which modify the lexical head Ns with [F], as shown in (19).

(19) a. Taroo-wa [DP [TP Hanako-ga sinda] hi-o]
Taroo-Top Hanako-Nom died day-Acc
remember.can-Neg
‘Taroo cannot remember the day when Hanako died.’

b. Taroo-wa [DP [TP Hanako-ga taizaisita] basyo-o]
Taroo-Top Hanako-Nom stayed place-Acc
remember.can-Neg
‘Taroo cannot remember the place where Hanako stayed.’

The above observation might suggest that the modified head nouns *hi* ‘day’ in (19a) and *basyo* ‘place’ in (19b) are Ns with [F] in Japanese, which can function as the lexical head of DP adverbs.

In fact, temporal nouns such as *hi* ‘day’ in (19a) can be used as the lexical head of a DP adverb without a temporal adposition *-ni*, as shown in (20).6

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6 In addition, in Japanese the temporal expressions for time span can be used without a temporal adposition *-ni*, as shown in (i).

(i) Hanako-ga [DP sono kikan](ni) Tokyo-ni taizaisita.
Hanako-Nom that.Gen time.span(-NI) Tokyo-in stayed
‘Hanako stayed in Tokyo during that period.’
The corresponding gapless relative clause is well-formed, as shown in (ii).

(ii) Taroo-wa [DP [Hanako-ga taizaisita] {hibi/kikan}-o] hurikaetta.
Taroo-Top Hanako-Nom stayed days/time.span-Acc looked.back
‘Taroo looked back to {the days Hanako stayed / the period during which Hanako stayed}.’
(20) a. Hanako-ga [DP sono {toki/hi/tuki/tosi}](ni) sinda.
    Hanako-Nom that.Gen {time/day/month/year}(-NI) died
    ‘Hanako died {that time/that day/that month/that year}.’

b. Hanako-ga [DP {sen-getu/1985-nen}](ni) sinda.
    Hanako-Nom {previous-month/1985-year}(-NI) died
    ‘Hanako died {last month/in 1985}.’

A spatial noun in Japanese, however, cannot be the lexical head of DP adverbs. The spatial adposition -ni must be overt in the sentence, as shown in (21).7

(21) Hanako-ga [DP sono {basyo/ie/zyuusyo/tiiki}]*(-ni) taizaisita.
    Hanako-Nom that.Gen {place/house/address/area}(-NI) stayed
    ‘Hanako stayed in that {place/house/address/area}.’

Given that the spatial nouns in Japanese are without [F], a question arises as to where the spatial adposition in (19b) has gone. The adposition must be overt within the relative clause in (19b), as we have observed in the case of the relativization of the spatial noun bungalow in (16) and (17). Note that in Japanese the overt adposition cannot occur in relative clauses, as shown in (22).8

(22) *Taroo-wa [TP Hanako-ga [PP-ni] taizaisita] basyo-o]
    Taroo-Top Hanako-Nom -NI stayed place-Acc
    can.remember-neg

One might wonder whether the relativization of a -wa marked topic would yield a gapless relative clause in Japanese because the bare spatial

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7 One might point out that the word tokoro ‘place’ is the most abstract spatial noun denoting location. As shown in (i), tokoro is often “modified” by a “gapless” clause, which is sometimes considered to be an instance of a spatial relative clause.

(i) Taroo-wa [DP Hanako-ga taizaisita] tokoro-o] omoidase-nai.
    Taroo-Top Hanako-Nom stayed place-Acc can.remember-Neg
    ‘Taroo cannot remember the place Hanako stayed.’

However, the noun tokoro cannot be used as a spatial expression in a main clause unless tokoro occurs with the indefinite demonstrative aru, as shown in (ii).

(ii) *Hanako-ga [DP {Ø/kono/sono/ano} tokoro]-ni taizaisita.
    Hanako-Nom this/that/that.Gen place-NI stayed

As shown in (ii), it is ungrammatical even with an overt adpositional marking. As shown in (iii), the contracted form ko can be used as a spatial nominal but not as a DP adverb.

(iii) Hanako-ga [DP soko]*(-ni) taizaisita.
    Hanako-Nom that.place(-NI) stayed
    ‘Hanako stayed there.’

8 Japanese does not have any overt relativizer.
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DPs can be licensed by -wa, as shown in (23).

(23) a. Sono basyo(-ni)-wa [Taroo-ga itta].
    that place(-NI)-Top Taroo-Nom went
b. Sono basyo(-ni)-wa [Taroo-ga sundeita].
    that place(-NI)-Top Taroo-Nom lived

However, the topic marker cannot always license the bare spatial DPs as shown in (24), while relativization is always possible without any overt adpositions as shown in (25).9

(24) Sono basyo*(-de)-wa [Taroo-ga sinda].
    that place(-DE)-Top Taroo-Nom died
(25) a. [Taroo-ga itta] basyo …
b. [Taroo-ga sundeita] basyo …
c. [Taroo-ga sinda] basyo …

The question of why the spatial adpositions in Japanese are missing in the case of relativization cannot be answered by assuming the relativization to be of topicalized phrases.

So far we have seen that only the lexical head N of DP adverbs which bears the feature [F] can be a head noun of the seemingly gapless relative clauses. On the other hand, theNs without [F] can only be the head noun of gapped relative clauses in English. However, we have also observed that the spatial Ns without the feature [F] in Japanese, such as basyo ‘place,’ can be the head noun of seemingly gapless relative clauses. In the next section, we will discuss the derivation of ordinary gapped relative clauses, adopting the Promotion Analysis of relativization, and then consider the relativization of DP adverbs.

3.3. Relativization of DP Adverbs
3.3.1. Promotion Analysis

Let us first consider the derivation of ordinary gapped relative clauses, exemplified in (26).

(26) the boy who I am talking with

The DP which involves the relativizer who undergoes A’-movement to the

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9 It can be considered that -ni is a Case marker, whose semantic role depends on the type of the predicate, while -de is a genuine adposition. The -ni marked phrases and the -de marked phrases can co-occur, as shown in (i).

(i) Taroo-wa ronbun-o sono kikan-ni 1-syuukan-de siageta.
    Taroo-Top paper-Acc that period-NI 1-week-DE finish.past
    ‘Taroo finished the paper within that period, and it took a week/seven days.’

What counts as a “missing adposition” is, then, only -de.
specifier position of CP. In the first step of the derivation, adopting Rizzi’s (1997) fine structure of CP, Bianchi (1999) claims that the A’-movement of the phrase which contains a relativizer targets the specifier position of Top(ic)P, leaving its copy [\textit{who boy}], as illustrated in (27).\footnote{The relativizer is marked by the subscript notation “\textit{R}” for expository purposes.}

\begin{align*}
\text{(27) } & [\text{TopP } \{\text{DP who}_R \text{ [boy]}\}, \text{Top } [\text{TP I am talking } [\text{PP with } [\text{DP who}_R \text{ [boy]]}]])
\end{align*}

Bianchi (1999) also claims that the “internal” head noun [\textit{boy}] in the specifier of TopP is raised further, following the Promotion Analysis (Kayne (1994)) of relativization. In this second step, the internal head noun [\textit{boy}] moves to the specifier position of ForceP from within the phrase, leaving its copy, as illustrated in (28).

\begin{align*}
\text{(28) } & [\text{ForceP } \{\text{boy}\}, \text{Force } [\text{TopP } [\text{DP who}_R \text{ [boy]}], \text{Top } [\text{TP } \ldots ]])]
\end{align*}

Finally, the nominal functional layers such as DP are projected above the relative clause, as shown in (29).\footnote{One of the anonymous reviewers pointed out that the structural Case and argument \(\theta\)-roles would be both doubly assigned to the head noun in and out of the relative clause if we assume the Promotion of the head noun. Notice that what is promoted is the head noun NP. Under the DP analysis, Case and \(\theta\)-role are assigned to DP and we have two distinct DPs, as shown in (29), in which the Case is not doubly assigned to one DP, nor is the \(\theta\)-role. See note 12. See also the Introduction (Inokuma (this volume)) for relevant discussion.}

\begin{align*}
\text{(29) } & [\text{DP the } [\text{forceP } \{\text{boy}\}, \text{Force } [\text{TopP } [\text{DP who}_R \text{ [boy]}], \text{Top } [\text{TP } \ldots ]]))]
\end{align*}

Given the copy of the relativized head within TP as shown in (27), the following reconstruction effects are accounted for (Schachter (1973), Kayne (1994), Bianchi (1999), Safir (1999), Aoun and Li (2003) and Szczegielniak (2004)).

\begin{align*}
\text{(30) } & \begin{align*}
\text{a. } & \text{The headway that John made was satisfactory.} \nonumber \\
\text{b. } & \text{John is looking for someone that knows every application.} \nonumber \\
\text{c. } & \text{The picture of himself, that John painted in art class is impressive.} \nonumber
\end{align*}
\end{align*}

In (30a), the nominal part of an idiom chunk \textit{to make headway}, namely \textit{headway}, is relativized but is still interpreted as a part of the whole idiom. In (30b), the scope of the quantified head noun \textit{someone} can be construed under the scope of the quantifier \textit{every}. In (30c), the reflexive pronoun \textit{himself} can be co-referential with the embedded subject \textit{John}. These reconstruction effects are accounted for by allowing the possibility of interpreting the lower copy of the internal head, as illustrated in (31).
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(31) a. \([\text{TopP} \ [\text{DP} \ D_R \ \text{headway}]_i \ \text{that} \ [\text{TP} \ \text{we made} \ [\text{DP} \ D_R \ \text{headway}]_i]]\]
b. \([\text{TopP} \ [\text{DP} \ D_R \ \text{someone}]_i \ \text{that} \ [\text{TP} \ [\text{DP} \ D_R \ \text{someone}]_i \ \text{knows every application}]]\]
c. \([\text{TopP} \ [\text{DP} \ D_R \ \text{picture of himself}]_i \ \text{that} \ [\text{TP} \ \text{John painted} \ [\text{DP} \ D_R \ \text{picture of himself}]_i]]\]

In the examples in (31), the internal head noun is pied-piped along with A'-movement of the covert relativizer which is the head of DP (represented as D_R), leaving its copy within TP although it is unpronounced.

Further raising of the internal head noun, i.e. the Promotion Analysis illustrated in (28), accounts for the non-pronunciation of the internal head noun, as illustrated in (32).\(^{12, 13}\)

\[
\text{(32)}
\begin{array}{c}
\text{DP} \\
\text{D} \\
\text{XP}_1 \\
\text{head noun} \\
\text{D_R} \\
\text{XP}_1
\end{array}
\begin{array}{c}
\text{ForceP} \\
\text{Force} \\
\text{TopP} \\
\text{Top} \\
\text{TP}
\end{array}
\]

In addition, in languages like Japanese which have an RC-N order, TP is considered to be raised above the promoted head noun (cf. Kayne (1994)).

Now consider the derivation of the relative clauses which involve a DP adverb gap.

(33) a. Lily dreaded the time that he had to go.
    b. Lily adores the place that he lives.

First, let us consider the function of the relativized DP adverbs in the super-ordinate clauses. The relativized DP adverbs in (33) end up being an argu-

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\(^{12}\) The head noun in the specifier position of ForceP is not just NP but is considered to project NumberP, which is a functional projection in between DP and NP (Inada (2008)).

\(^{13}\) An adjunction and Matching analysis of relativization would also account for the non-pronunciation of the internal head noun if we assume obligatory deletion of the higher copy. In fact, Safir (1999) and Szczegelniak (2004) suggest that the internal head undergoes “Matching” with the “external” head noun outside the relative clause, and is deleted under the “identity condition.”

For the two head nouns to be identical, however, the relative clause must be adjoined above the external head noun because the relative clause must not be included in the external head noun. Then, the external head noun does not c-command the relative clause nor the internal head noun (cf. Chomsky (1995)), which must be deleted. Due to space limitations, this paper does not pursue the possibility of the obligatory deletion of the higher copy in English.
ment of the main verb. In (33), the function of the head noun time/place inside the relative clause does not match that of the relativized head in the superordinate clause.

Under the silent PP analysis, the phonetically null adposition, designated as ØP, is right above the adverbial spatio-temporal DP. The relative clauses in (33) are derived via the relativization of the DP adverbs, leaving the silent adposition ØP within TP. The lexical head N of the DP adverb is, then, promoted further to the specifier position of ForceP.

\[(34)\]
\[
\text{a. } \left[\text{ForceP} \left[\text{time}_{[F]}\right] / \left[\text{TopP} \left[\text{DP D}_R \text{time}_{[F]}\right]_i \right] \text{ that } \left[\text{TP} \text{ he had to go } \left[\text{PP ØP \left[\text{DP D}_R \text{time}_{[F]}\right]_i \right] \right] \right].
\]
\[
\text{b. } \left[\text{ForceP} \left[\text{place}_{[F]}\right] / \left[\text{TopP} \left[\text{DP D}_R \text{place}_{[F]}\right]_i \right] \text{ that } \left[\text{TP} \text{ he lives } \left[\text{PP ØP \left[\text{DP D}_R \text{place}_{[F]}\right]_i \right] \right] \right].
\]
ForceP merges with the matrix D, and the DP as a whole is the argument of the main verb, as illustrated in (35).

\[(35)\]
\[
\text{a. } \text{Lily dreaded } \left[\text{DP the } \left[\text{ForceP} \left[\text{time}_{[F]}\right] \right] \right].
\]
\[
\text{b. } \text{Lily adores } \left[\text{DP the } \left[\text{ForceP} \left[\text{place}_{[F]}\right] \right] \right].
\]
By way of comparison, let us consider the possible derivation of the relativization of DP adverbs shown in (33) under the Promotion Analysis with Larson’s (1985) assumption that Oblique Case assignment is optional in relativization. Following Larson’s (1985) analysis, the DP adverbs in (33) would be properly assigned an Oblique Case within the relative clause by means of the inherent lexical feature [F] of N, while the superordinate DPs would not be assigned an Oblique Case by the same [F], as illustrated in (36).

\[(36)\]
\[
\text{a. } \text{Lily dreaded } \left[\text{DP the } \left[\text{ForceP} \left[\text{time}_{[F]}\right] \right] \text{ that he had to go } \left[\text{DP D}_R \left[\text{Oblq} \left[\text{time}_{[F]}\right]_i \right] \right] \right].
\]
\[
\text{b. } \text{Lily adores } \left[\text{DP the } \left[\text{ForceP} \left[\text{place}_{[F]}\right] \right] \text{ that he lives } \left[\text{DP D}_R \left[\text{Oblq} \left[\text{place}_{[F]}\right]_i \right] \right] \right].
\]
Larson (1985) observes that there are cases in which the superordinate DPs are considered to be assigned Oblique Case by the feature [F], as exemplified in (37).

\[(37)\]
\[
\text{a. } \text{John left that day that you spent at the beach.} \quad \text{(Larson (1985: 619))}
\]
\[
\text{b. } \text{You have lived the places that I cared for.} \quad \text{(Larson (1985: 597))}
\]
The examples in (37) would be derived as illustrated in (38).

\[(38)\]
\[
\text{a. } \text{John left } \left[\text{DP that } \left[\text{Oblq} \left[\text{ForceP} \left[\text{day}_{[F]}\right]_i \right] \right] \text{ that you spent } \left[\text{DP D \left[\text{day}_{[F]}\right]_i \right] \right] \text{ at the beach}] \right].
\]
\[
\text{b. } \text{You have lived } \left[\text{DP the[Oblq] } \left[\text{ForceP} \left[\text{places}_{[F]}\right]_i \right] \text{ that I cared for } \left[\text{DP D \left[\text{places}_{[F]}\right]_i \right] \right] \right].
In (38), the feature [F] would originate in the argument DP within the relative clause and assign Oblique Case to the superordinate DP. In order to account for the relativization of DP adverbs such as those exemplified in (33) and that of the potential DP adverbs such as those exemplified in (37), Oblique Case should be assigned to DP optionally by its lexical head N with the feature [F].

However, we have observed in section 2.2 that DP adverbs cannot occur in the mid-position of the sentence, where PPs never occur, as repeated below.

(12) a. *Smith may have [DP_{adv} that day] withdrawn his lawsuit.

(13) a. ??Smith may have [PP on a subsequent day] withdrawn his lawsuit.

   b. *BT will [PP in March] begin to market Europe’s first international videophone …

We have to say that DP adverbs are ungrammatical when they occur in positions in which PPs cannot occur, regardless of whether Oblique Case is assigned optionally to them or not. In (37), for example, Oblique Case is assigned inherently to DP adverbs in the superordinate clause by their lexical head N with [F] because they are in the positions in which PPs can occur. Once we adopt the silent PP analysis, on the other hand, we can dispense with the optional Oblique Case assignment mechanism.

3.3.2. Stranding of Silent Adposition

In this section, let us consider the possibility of stranding of the silent adposition in the relativization of DP adverbs, which will provide a piece of evidence for an invisible PP structure. The promoted lexical head N with the feature [F] allows the superordinate DP to be a sister of the superordinate adposition, which can be silent, as illustrated in (39).

(39) a. John left [PP ØP [DP that [ForceP [day [F] ] ...]]].

   b. You have arrived [PP ØP [DP the [ForceP [places [F] ] ...]]].

Within the relative clause, the head N with [F] in (39) can be a lexical head of DP which is a sister of another silent adposition.

(39)’ a. [PP ØP [DP that [ForceP [day [F] ] ...] [TP ... [PP ØP [DP D_R [day [F] ]]]]]].

   b. [PP ØP [DP the [ForceP [places [F] ] ...] [TP ... [PP ØP [DP D_R [place [F] ]]]]]].

As we have observed in section 3.1, the overt adposition can be stranded at the base position of the relativized head, regardless of whether the head noun is N with [F] such as place or N without [F] such as bungalow, as shown in (40).
(40)  a. [TopP [DP D_R {place_{[F]}/bungalow}] [TP he lives [PP in [DP____]]]]
b. [TopP [DP which_R {place_{[F]}/bungalow}] [TP he lives [PP in [DP____]]]]

The covert relativizer is used in (40a), and the overt wh-relativizer which is used in (40b). With the overt wh-relativizer, the overt adposition can be pied-piped, as shown in (41).

(41) [TopP [PP in [DP which_R {place_{[F]}/bungalow}]]) [TP he lives [PP____]]]

The R-pronoun where can also be used as a relativizer regardless of the feature [F], as shown in (42).

(42) [TopP [PP where_R {place_{[F]}/bungalow}] [TP he lives [PP____]]]

As we have also seen in section 3.1, the covert relativizer cannot be used in the seemingly gapless relative clause when the head noun is N without [F], bungalow in this case, as shown in (43).

(43)  a. [TopP [DP D_R place_{[F]} [TP he lives]]]
b. *[TopP [DP D_R bungalow] [TP he lives]]

Based on these observations, we can conclude that in (42), what allows place/bungalow to function as adverbials within TP is pied-piped in the same way as in (41), while in (43), it is not pied-piped by D_R, but is left within TP in the same way as in (40). Moreover, the contrast between (42) and (43b) indicates that what allows DPs to function as adverbials is not DP-internal, but DP-external. What is left within TP in (43a) is, then, the stranded silent adposition, which is not available in (43b) because only DPs headed by Ns with [F] can be the complement of the silent adposition.¹⁴

Note that what undergoes A’-movement in (42) cannot be analyzed as DP accompanied with the silent adposition as illustrated in (44), because the noun bungalow, which is without the feature [F], can be the head noun of the where-relative.

(44) * [PP Ø_p [DP where_R bungalow]]

The bare DP analysis of DP adverbs says nothing about the contrast between (42) and (43). In Larson’s (1985) analysis, the where phrase in (42) does not constitute PP but is a bare DP.¹⁵

As we have discussed in section 3.2, none of the spatial nouns in Japa-

¹⁴ This paper assumes that the adposition cannot be pied-piped by the covert relativizer. For more detailed discussion of pied-piping of the silent adposition, see Caponigro and Pearl (2008).

¹⁵ Notice that this paper basically follows Larson’s (1985) assumption that the feature [F] of some spatio-temporal Ns, the lexical heads of DP adverbs, licenses their occurrence: in Larson (1985) they are assigned Oblique Case, whereas in this paper (and in McCawley (1988), too) they are selected as a complement of the silent P.
nese are compatible with the silent adposition as we have observed in (21),
while they can be the head noun of seemingly gapless relative clauses as we
have observed in (19b).

(21) Hanako-ga [DP sono {basyo/ie/zyuusyo/tiiki]*(-ni) taizaisita.
Hanako-Nom that.Gen {place/house/address/area}(-NI) stayed
‘Hanako stayed in that {place/house/address/area}.’

(19b) Taroo-wa [DP [TP Hanako-ga taizaisita] basyo-o]
Taroo-Top Hanako-Nom stayed place-Acc
remember.can-Neg
‘Taroo cannot remember the place Hanako stayed.’

The fact that TP in (19b) does not involve an overt adposition indicates that
the relative clause in (19b) is derived via A’-movement of PP to the speci-
fier position of TopP, leaving the copy of the PP within TP. Since the noun 
*basyo ‘place’ is incompatible with the silent adposition, the moved PP in
(19b) cannot be headed by the silent adposition, as illustrated in (45).16

(45) *[TopP [PP ØP [DP ØR basyo], [TP Hanako-ga [PP ___]i taizaisita]])
We can conclude that the Japanese covert relativizer in (19b) is a silent
counterpart of the English spatial wh-relativizer *where*, as illustrated in (46).

(46) a. [TopP [PP ØR basyo], [TP Hanako-ga [PP ___]i taizaisita] Top]].
    b. [TopP [PP whereR bungalow], Top [TP Hanako lived [PP ___]]]]

An anonymous EL reviewer pointed out that “it is rather surprising if there is indeed
no way for Larson’s [(1985)] analysis to account for these familiar data under Kayne’s
[(1994)] promotion analysis.” And he/she “wonder[s] why we cannot suggest the fol-
lowing possibility to save Larson’s [(1985)] analysis under Kayne’s [(1994)] promotion
analysis.”

   (i) [TopP [DP whereR[+Oblq] [N place/bungalow]] [TP he lives [PP ____]]]]
   (ii) a. [TopP [DP D R [N place[+Oblq]]] [TP he lives]]
   b. *[TopP [DP D R [N bungalow[+Oblq]]] [TP he lives]]

(→[DP D R bungalow] is *, because it is Caseless.)

“Namely, if we assume that not [N bungalow] but [D where] and [N place] can assign in-
herent Oblique Case to DP, we can straightforwardly rule out [(iib)], and can rule in [(i)]
and [(iia)] for Case reasons.” Furthermore, the reviewer pointed out that “[g]iven this
rather obvious possibility, … [we] cannot claim … that the R-pronoun where has a PP
structure.”

The alternative suggested above assumes that not only Ns but Ds can also bear [F] and
are able to license DP adverbs, in order to save “Larson’s (1985) analysis.” Then, we
have to assume that the null operator D R would never assign Oblique Case, or that the
Case-assigning D R would be incompatible with some Ns such as bungalow. The silent
PP analysis presented in this paper accounts for the relativization of DP adverbs without
additional assumptions.

16 As noted in section 3.3.1, TP is raised above the head noun in Japanese.
The overt adposition is absent in spatial relative clauses in Japanese such as the one exemplified in (19b) because the covert spatial relativizer in Japanese itself has a PP structure, which includes the spatial adposition.

3.4. On Spatio-Temporal R-Pronouns

In section 3.3.2, we have argued that the R-pronoun where has a PP structure. Let us assume here that all R-pronouns are PPs. Unlike other DP adverbs, R-pronouns such as now, then, here, and there cannot occur in the position of the subject or that of the direct object of a verb, as shown in (47).

(47) a. {*Then/That hour} elapsed quickly.
    b. I am spending {*now/*then/that day} at the beach.
    c. Penguins inhabit {*here/*there/few places}.

    (Larson (1985: 612))

The R-pronouns when and where cannot originate in these positions, as shown in (48).

(48) a. {*When/Which hour} elapsed quickly?
    b. {*When/Which day} did you spend at the beach?
    c. {*Where/Which places} do penguins inhabit?

    (Larson (1985: 612))

R-pronouns and PPs cannot occur in the specifier position of DP while the spatio-temporal DPs can, as shown in (49).\(^\text{17}\)

(49) a. *[every morning]’s lecture
    b. *[then/there]’s lecture
    c. *[in the room]’s lecture

Notice that DP adverbs can be substituted for DPs when they are without the silent adposition. In Larson’s (1985) analysis, the spatio-temporal R-pronouns such as here, there, and then are DPs. Caponigro and Pearl (2009) also claim that the spatio-temporal wh-relativizers such as when and where are genuine DPs, not PPs. Caponigro and Pearl (2009) argue that R-pronouns are DPs because the overt stranding of a certain class of adposi-

\(^{17}\) One of the anonymous EL reviewers brings the data in (49) to my attention. Moreover, temporal proforms like now and then behave more like simplex adverbs as they are legitimate in the preverbal position of a sentence, as shown below.

(i) a. Flick it off now.
    b. His wife liked to keep track of him then.
    c. This system is now used throughout the world.
    d. [He] will then have created the worst of all worlds.

    (Haumann (2007: 268))
tions is possible, as shown in (50).

(50) a. Jack disliked [where we just ran [PP past [where]]]—it smelled funny.
     b. Lily lives [(near) [where we have to fly [PP through [where]] on our way to Vancouver]].
     c. Lily’s schedule can’t accommodate [when Jack needs the car [PP by [when]]] (Caponigro and Pearl (2009: 159))

The examples in (50) indicate that the R-pronouns where/when can be extracted from within a PP structure, suggesting that they can be DPs.

However, stranding of the spatial adposition in at the base position of where is impossible, as shown in (51).¹⁸

(51) *Jack disliked [where he lives [in where]].

Caponigro and Pearl (2009: 160), who argue that where is a DP, note in the text that “the overt P in never occurs as the sister of the trace of where, when, and how,” assuming that “in is incompatible with where, when, and how.”

The contrast between (50) and (51) is explained if we claim that a certain class of adpositions such as in in (51) is a part of the PP-structure of R-pronouns, but adpositions such as past, through, and by in (50) are not. Building on Koopman (2000), den Dikken (2010) proposes the split PP structure, which mainly consists of two parts illustrated in (52).

(52) [PdirP Pdir [PlocP Ploc [DP]]]

It has a structure with the locative part at the bottom and the directional part at the top. With this split PP structure, we can say that the lower adposition of location/place such as in exemplified in (51) is (at least) a part of the PP structure of R-pronouns, but the higher adposition of direction/path such as past, through or by in (50) is not. Because R-pronouns always project PlocP structure, they can be substituted for DP adverbs, which consist of a silent adposition plus a spatio-temporal DP, while they cannot

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¹⁸ Although Caponigro and Pearl (2008) suggest that a certain class of adpositions such as in and at is covert right above R-pronouns, why those adpositions cannot be overt is not accounted for. Collins (2007) points out that the following alternation exists in colloquial English.

(i) Where is he staying (at)?

In Collins’ (2007) analysis the pronunciation of the stranded adposition is legitimate because its specifier position is not filled. Under the analysis presented in this paper, the occurrence of the overt adposition at in (i) should be considered as an instance of partial pronunciation of the lower copy. See also Kayne (2005).
be substituted for genuine DPs in the argument position.  

4. Conclusion

This paper has shown that the relativization of DP adverbs is best analyzed under a silent PP analysis of DP adverbs. Adopting the Promotion Analysis, it has been shown that the relativization of Ns with the feature [F] sometimes yields seemingly gapless relative clauses, in which the silent adposition is stranded. Since Ns with [F] are potential lexical heads of DP adverbs, this provides a piece of evidence for the silent PP analysis of DP adverbs.

It has been also shown that the R-pronouns such as where are not bare DPs as suggested in Larson (1985) or DPs in the complement position of the silent adposition as suggested in Caponigro and Pearl (2008, 2009), but that they incorporate some overt adpositions which occupy the head of PlocP of the split PP structure. In addition, the PlocP structure of the R-pronouns accounts for why overt spatial adpositions in Japanese are missing in the case of relativization.

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19 Katz and Postal (1964) propose that where is derived from at which place, which is considered to have the lower spatial PP structure in the present analysis. As for the morpho-phonological realization, the spatial wh-relativizer where can be associated with several heads, i.e. AT-wh-there, and is lexicalized into a simple word, following the framework of Distributed Morphology (Halle and Marantz (1993)).

On the other hand, Kayne (2005) follows and refines Katz and Postal’s (1964) analysis. Kayne (2005) claims that spatial there consists of an unpronounced counterpart of place and an unpronounced determiner, an equivalent of that. In Kayne’s (2005) analysis, there itself is a demonstrative and requires the PP structure in order to function as a simplex spatial adverb.
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