

## **Mixed properties and matching effects in English free relatives: A construction-based perspective\***

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**Kim, Jong-Bok. 2017. Mixed properties and matching effects in English free relatives: A construction-based perspective.** *Linguistic Research* 34(3), 361-385. English free relative clauses display dual properties. In terms of internal syntax, they are sentential, but in terms of external syntax, they behave like nominal expressions. These mixed properties assign many complexities to the constructions. Another intriguing property related to the mixed properties concerns matching and mismatching effects among the categorial information of the free relative, that of the *wh*-phrase, and the putative gap in the relative. This paper reviews these properties with investigating their authentic uses through the corpus COCA (Corpus of Contemporary American English) and then offers a construction-based analysis. The resulting analysis offers a streamlined analysis of English free relatives, avoiding pitfalls that previous analyses often encounter. (Kyung Hee University)

**Keywords** mixed properties, matching effects, free relative, construction-based, inheritance network

### **1. Introduction**

Examples in (1) illustrate typical free relative clauses in English:<sup>1</sup>

- (1) a. I do not have the money to eat [<sub>FR</sub> what they tell me to eat].  
(COCA 2017 ACAD)

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1 The corpus COCA (Contemporary of American English) is a balanced corpus of American English containing 520 million words of text equally divided among spoken, fiction, popular magazines, newspapers, and academic texts.

- b. Families should be allowed to choose [<sub>FR</sub> where their children learn]. (COCA 2016 NEWS)

The defining property of the free relative, as seen from the examples, is that it is a type of relative clause beginning with a *wh*-expression that includes the antecedent within itself (see, among others, Bresnan and Grimshaw 1978, Baker 1989, Huddleston and Pullum 2002). The free relative, also called fused relatives, is thus an independent clause with no explicit antecedent external to it, different from core relatives (Quirk *et al.* 1985, Ojeda 2011):

- (2) a. I do not have the money to eat [the thing [<sub>REL</sub> that they tell me to eat]].  
 b. Families should be allowed to choose [the place [<sub>REL</sub> where their children learn]].

The antecedent *the thing* and the relative pronoun *that* in (2a) are in a sense fused into *what* in (1a).

This fused property also allows the clause to function as the object of the verb *eat*. The same behavior is observed with complex free relative pronouns like *whatever*, *whenever*, *whichever*, and others:

- (3) a. My dad would just buy [whatever they had on the showroom floor]. (COCA 2009 MAG)  
 b. They were planning the conquest of [wherever they landed]. (COCA 2006 FIC)

The bracket expressions here are embedded clauses, but at the same time function as the nominal object of the verb *buy* and the preposition *of*.

As being an independent clause introduced by a *wh*-expression, the free relative is sentential or bears clausal properties. Note that the free relative clause, as another characteristic property, has nominal properties in the sense that it occurs in canonical NP positions.

- (4) a. [Whatever I wanted to know] was at the touch of my fingertips. (COCA 2017 FIC)

- b. In fact, presidents don't always get [what they want]. (COCA 2017 NEWS)
- c. This was [where my values started to clash with real life]. (COCA 2017 SPOK)
- d. So inflation is a wonderful clue to [what happened to the song]. (COCA 2017 ACAD)

As observed here, free relatives serve as a subject, verb object, predicative complement, and prepositional object.

This paper discusses these mixed properties of English free relative clauses and offers a construction-based analysis (see Kim 2001 for a similar analysis). In doing so, we first review some of the key properties of the construction, referring to the authentic data extracted from the corpus COCA (Corpus of Contemporary American English). It then offers a construction-based analysis for these clausal and nominal properties.

## 2. Disentangling free relatives from interrogative clauses

One key intriguing property of the free relative concerns its similarities with interrogative clauses (see, among others, Baker 1995, Grosu 2002, Riemsdijk 2006, Ott 2011):

- (5) a. I lost [what he has brought me for my birthday]. (Free relative)
- b. I wonder [what he has brought me for my birthday]. (Interrogative clause)

As illustrated here, in spite of the surface resemblance, the embedded clause in (5a) is a free relative while the one in (5b) is an interrogative clause. This difference is mainly caused by the external element *lost* and *wonder*. The former *lost* requires an NP while the latter *wonder* selects an interrogative clause:

- (6) a. I lost my job.
- b. \*I wonder the job.

There are both internal and external factors that can differentiate the two constructions (for detailed discussion, see Baker 1995, Huddleston and Pullum 2002). One key difference concerns the lexical restrictions on the licensed *wh*-words. That is, in the free relative, only a limited set of *wh*-words (*what*, *where*, *when*) is allowed. For instance, *why* and *how* can be in the interrogative clause, but not in the free relative, as seen from the following contrast:

- (7) a. Joe guessed [why the receipts were unavailable].  
 b. Joe guessed [how much money Arthur earned].
- (8) a. \*Joe borrowed [why the receipts were unavailable].  
 b. \*Joe borrowed [how much money Arthur earned].

The *wh*-expressions *where* and *when*, however, can introduce free relatives, as seen from corpus examples:

- (9) a. He jumped and didn't look [where he was jumping to]. (COCA 2015 SPOK)  
 b. An overdraft occurs [when consumers lack the funds in their account to cover a transaction]. (COCA 2017 NEWS)

The finiteness of the clause also tells free relatives from interrogatives:

- (10) a. I wonder who I can blame it on. (COCA 1995 FIC)  
 b. I wonder whom to blame it on.
- (11) a. He's still wearing what he wore to bed. (COCA 2011 FIC)  
 b. \*He is still wearing what to wear to bed.

The contrast shows us that the free relative, different from the interrogative clause, cannot be infinitival.

Beside these internal properties, there are some external properties that we can refer to in differentiating the two constructions. The first external property concerns the type of predicate selecting a free relative or an interrogative clause. For instance,

verbs like *taste* requires a nominal object including a free relative as in (12), but cannot combine with an interrogative clause as given in (13):

- (12) a. I could almost taste [the food she was packing]. (COCA 2005 FIC)  
b. We're there to taste [what the chef has to offer]. (COCA 2010 NEWS)

- (13) a. \*We tasted [which food Bill served to her].  
b. \*We tasted [how much pasta Fred offered to her].

Examples like (13) will be fine with an interrogative selecting verb:

- (14) a. I was wondering [which world leader told her that we needed to invade Iraq]. (COCA 2007 MAG)  
b. Sometimes I wonder [how much news I can hear]. (COCA 2017 FIC)

Another external property we can refer to is a compatibility requirement arising from the semantic nature of free relatives (see Baker 1995). The free relative with the distributional properties of a typical NP denotes a concrete entity, rather than a proposition (see Jacobson 1995). This in turn implies that (15a) could be interpreted as (15b):

- (15) a. She cooked [what we wanted].  
b. We wanted something X and she cooked X.

This kind of compatibility does not hold in the interrogative clause:

- (16) a. John realized [what Martha ate].  
b. Martha ate something X and John realized X.

The meaning of the clause *what Martha ate* cannot be interpreted as (16b) where the two Xs cannot denote the same X.

This compatibility requirement can be accompanied with a replacement test. That

is, if a clause can be replaced by *something*, *there* or *then*, it could be a free relative. Compare the following:

- (17) a. Tom stayed [where Mary had wanted to stay].  
b. Tom discovered [where Mary had wanted to stay].

The clause can be substituted by *there* in (17a) but not in (17b):

- (18) a. Karen stayed there.  
b. \*Karen discovered there.

Note that there are ambiguous examples which can function either as a free relative or an interrogative clause. Consider the following examples:

- (19) a. You never know [what you're going to get].  
b. [What he wrote] is unclear.

The bracket sequences can be interpreted as indirect questions, as seen from the following:

- (20) a. We never know [why he is angry].  
b. [Why he did it] is unclear.

We have seen that the clause introduced by *why* cannot be a free relative: it can function only as an indirect question. However, the bracket sequences can also be interpreted as free relatives: both examples satisfy two internal requirements: they are finite and introduced by *what*. The predicate *know* and *unclear* can also require a nonanimate NP as its object and subject:

- (21) a. They know the place well enough.  
b. The record is unclear on why it happened.

The compatibility requirement seems to be observed too:

- (22) a. You know something X and you are going to get X.  
b. He wrote something X and something X is unclear.

These tests indicate that sentences like (19) can involve either a free relative or an indirect question, depending on the context.

### 3. Nominal and sentential properties

We have earlier noted that free relatives externally act like nominal phrases despite their sentential categories. They occur in the canonical NP positions, but in terms of internal syntax, they display sentential properties (Bresnan and Grimshaw 1978, Kim 2001, Huddleston and Pullum 2002, Riemsdijk 2006, Ojeda 2011). All the free relatives have bipartite structures: a *wh*-phrase and an incomplete 'finite' sentence with a missing phrase:

- (23) a. Families ate [what [they grew \_\_\_]].  
b. [What [we'd found \_\_\_]] looked like an iron backbone.

The existence of a gap in these free relatives can be evidenced from the following:

- (24) a. \*Families ate [what [they grew the food]].  
b. \*[What [we'd found the backbone]] looked like an iron backbone.

Even though the internal structure is sentential, free relatives behave like nominal expressions in terms of distributional properties as we have seen earlier. Even in terms of semantics, we have seen that the free relative denotes an entity, not a proposition that a clause denotes. These properties distinguish free relatives from interrogatives. There are more non-clausal properties of the free relative that differ from interrogative clauses.

The subject-verb agreement fact assigns a distinctive property to the free relative from the interrogative clause (see Huddleston and Pullum 2002 among others). The clausal subject typically requires a singular verb as seen from the following:

- (25) a. [What clubs he went] was questioned by the police.  
 b. [What choices we will make] does not depend on the knowledge.

The clausal subject agrees with the singular verb here. However, in free relatives, the number value of the *wh*-phrase determines the subject-verb agreement:

- (26) a. [[What dreams] I had] **were** all in black and white and took place in the new unknown city. (COCA: 1990 MAG)  
 b. [[What furnishings] he has] **are** accented with Chinese artifacts and books on Chinese culture. (COCA: 1999 FIC)  
 c. [[What reductions] we do observe] **occur** only after simulating utterly unreachable success (COCA 1997 ACAD)

The head *wh*-phrases here are all plural, requiring the plural verb, implying that the *wh*-phrase in the free relative functions as the head of agreement.

The possibility of undergoing the SAI (Subject-Aux Inversion) also indicates the nominal properties of the free relative:

- (27) a. Does [what Mr. Bolock say] sound like a reasonable approach to the issue? (COCA 1995 SPOK)  
 b. Will [what I name my child] affect his or her personality? (COCA 2009 MAG)

We can observe that the clausal subject cannot participate in this kind of SAI construction:

- (28) a. [What he has done] is quite questionable.  
 b. \*Is [what he has done] quite questionable?

Extraposition also can indicate that the free relative has a nominal property. It is well-known that clausal expressions can be extraposed:

- (29) a. [What you have to say] is important to me. (COCA 2017 FIC)  
 b. It is important to me [what you have to say].



Note that the free relative cannot be extraposed:

- (30) a. [What he makes] does not fit into conventional categories. (COCA  
1991 NEWS)  
b. \*It does not fit into conventional categories [what he makes].

This contrast once again tells us the lack of clausal properties in the free relative.

Pied-piping also indicates that the free relative does not have a clausal property. The indirect question allows either the stranding of a preposition or its pied piping (Bresnan and Grimshaw 1978):

- (31) a. I wonder [what Kim is working on].  
b. I wonder [on what Kim is working].

The preposition *on* can be pied-piping along with the *wh*-phrase of the interrogative clause. However, this is not possible in the free relative: it licenses only the prepositional stranding:

- (32) a. He enjoyed [what he is working on].  
b. \*He enjoyed [on what he is working].

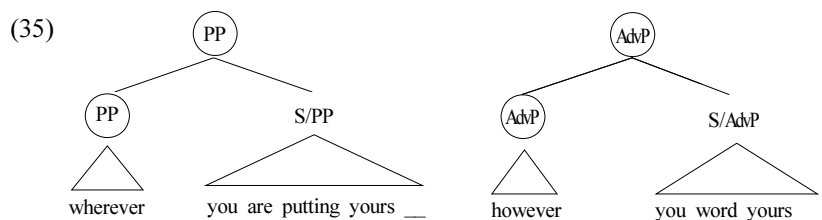
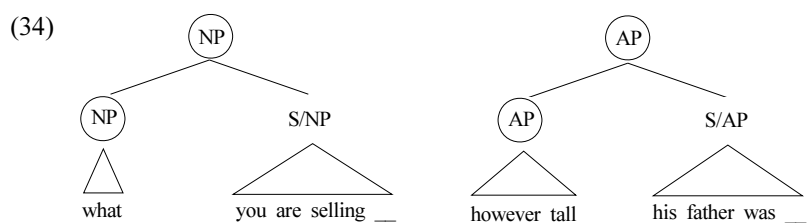
All these properties we have discussed so far indicate that the free relative has clausal properties in its internal structure, but also functions as a nominal expression in terms of its external syntax.

#### **4. Matching effects**

As noted in the literature (see Bresnan and Grimshaw 1978, Larson 1987, Kim 2001, Grosu 2002, Ojeda 2011, Ott 2011), the *wh*-phrase of a free relative has to be of the appropriate category for the position where the free relative appears. That is, the syntactic category of the *wh*-phrase introducing the free relative clause matches with that of the whole free relative selected by the head. This kind of matching effect can be easily observed from the following data:

- (33) a. I will buy  $[_{NP} [_{NP} \textit{what}] \textit{you are selling} [_{NP} \_ ]]$ .  
 b. John will be  $[_{AP} [_{AP} \textit{however tall}] \textit{his father was} [_{AP} \_ ]]$ .  
 c. I will put my books  $[_{PP} [_{PP} \textit{wherever}] \textit{you are putting yours} [_{PP} \_ ]]$ .  
 d. I'll word my letter  $[_{AdvP} [_{AdvP} \textit{however}] \textit{you word yours} [_{AdvP} \_ ]]$ .

The verb *buy* requires an NP object whose category matches with the *wh*-phrase *what*. In a similar manner, the category of the free relative required by *be*, *put*, and *word*, respectively is the same as the *wh*-phrase introducing the free relative.



Note that in addition to the matching effect between the category of the free relative clause and that of the *wh*-phrase, the gap in the free relative clause also has the same category information with that of the two. There is thus a matching effect among the three.

## 5. Mismatches and puzzles

We have seen the matching effects among the syntactic category of the free-relative, the *wh*-phrase, and the missing gap. However, as noted by Bresnan and Grimshaw (1978), Caponigro and Pearl (2009), and others, there could be mismatching effects

when the *wh*-phrase is introduced by *where* and *when*. Observe the following authentic data:

- (36) a. Let's find [<sub>NP</sub> where [you want to raise the bar [<sub>PP</sub>\_\_ ]]]. (COCA 2005 SPOK)  
 b. Whether you can buy wine online depends on [<sub>NP</sub> where [you live [<sub>PP</sub>\_\_ ]]]. (COCA 2007 MAG)

The free relative needs to be an NP because of the subcategorization requirement of *find* and *on*, but the *wh*-phrase and the putative gap seem to be a PP. A similar mismatch effect can be observed with *when*:

- (37) a. Google's new goal is to predict [<sub>NP</sub> when [you get sick [<sub>PP</sub> \_\_ ]]]. (COCA 2017 SPOK)  
 b. This is a typical result of [<sub>NP</sub> when [you get government involved [<sub>PP</sub> \_\_ ]]]. (COCA 2012 SPOK)

In these examples too, the matrix predicate *predict* or *determine* requires an NP object, but the free relative is introduced by the adverbial *when*. This situation is different from matching cases where the required free relative is an PP and it is introduced by *when*:

- (38) a. More than half of them came [<sub>PP</sub> when [Obama was in office [<sub>PP</sub> \_\_ ]]]. (COCA 2017 SPOK)  
 b. Lauren decides to stay [<sub>PP</sub> where [she is to wait her turn [<sub>PP</sub> \_\_ ]]]. (COCA 2017 FIC)

As noted by Caponigro (2002) and Caponigro and Pearl (2009), the gap in all these mismatching cases is other than an NP: it is either a PP or a AdvP matching with the *wh*-phrase. The mismatching effect is thus triggered in the environment where the external syntax requires the free relative to be an NP but the putative gap is not an NP, but a PP or AdvP matching with the *wh*-phrase *where* or *when*.

## 6. Two main previous analyses

There are two competing analyses for the structure of free relatives in English: the Head and the COMP analyses. The Head analysis takes the *wh*-phrase as the head of free relatives functioning as the antecedent of the free relative (see, among others, Bresnan and Grimshaw 1978, Larson 1997, Citko 2002, 2004). Meanwhile, the COMP analysis places the *wh*-phrase in the COMP with the antecedent of the free relative being empty (see, among others, Hirschbühler and Rivero 1983, Grosu 1996, 2003, van Riemsdijk 2006). These two views are illustrated in the following:

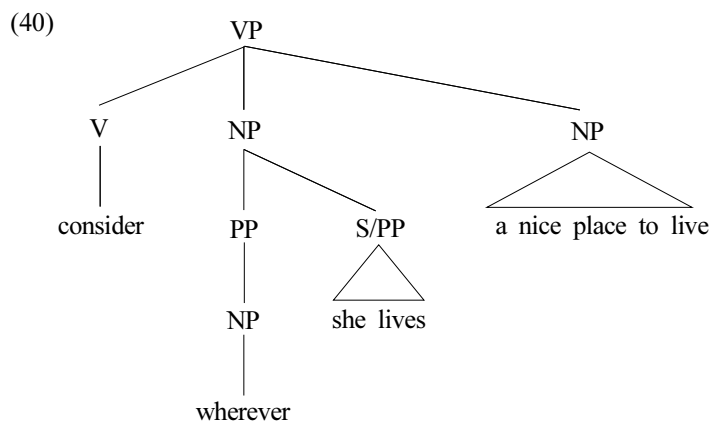
(39) a. Head Analysis:

I ate [<sub>NP</sub> *what* [<sub>S</sub> you ate]]

b. COMP Analysis:

I ate [<sub>NP</sub> PRO/pro [<sub>CP</sub> *what* [you ate]]]

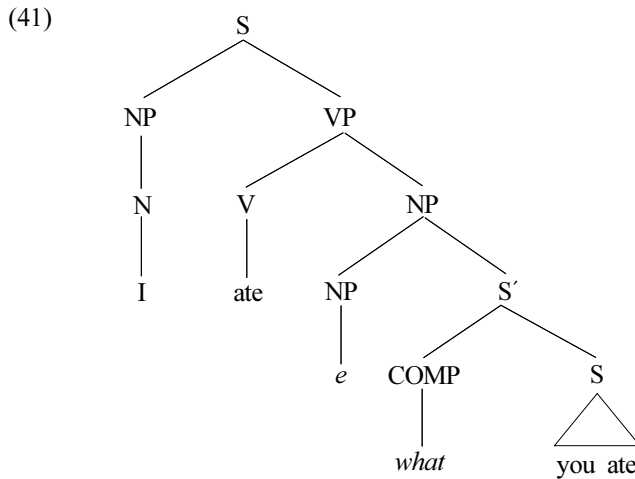
Each may have its own merits, but issues still remain in each. For instance, the Head analysis requires an ad hoc rule like the P-deletion rule for mismatching examples, as illustrated in the following (see Bresnan and Grimshaw 1978):



The verb *consider* requires an NP object in addition to its NP predicate, but the free relative clause includes a PP gap matching with the *wh*-phrase *wherever*. A solution that the Head analysis set forth by Bresnan and Grimshaw (1978) is to adopt a

P-deletion rule when the prepositional object is locative or temporal. This deletion rule turns the gap as well as the *wh*-phrase *wherever* into an NP as given in the tree structure.

Meantime, the COMP analysis runs into a locality issue. That is, it needs to show how the matrix predicate selecting a free relative assesses the relative in a nonlocal position, as illustrated in the following:



As illustrated here, the verb *ate* combines with an empty NP, but this is possible only when the NP governs a free relative. To avoid such an issue, Ott (2011) assumes that the *wh*-phrase in the COMP lacks interpretable features and moves to the head NP position. However, this still does not address the locality issue involved here.

Even if both analyses try to offer a principled account of free relatives, each requires an additional assumption that makes the grammar much more complicated. In what follows, we offer a construction-based Head analysis that may avoid such issues.

## 7. A construction-based Analysis

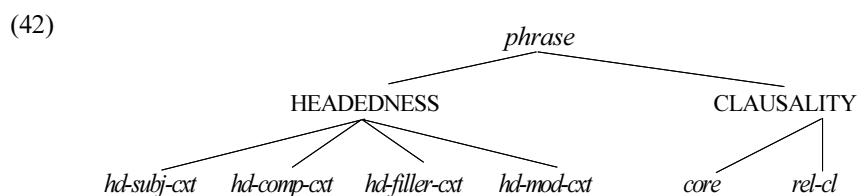
### 7.1 Some fundamentals

In accounting for the grammatical properties of the free relative construction, we

adopt the model of Construction Grammar (CxG), whose main features can be summarized as follows (see, among others, Goldberg 2006, Michaelis 2006, 2012, and Sag 2012, Kim 2016):

- All levels of description (including morpheme, word, phrase, and clause) are understood to involve pairings of form with semantic or discourse functions.
- Constructions vary in size and complexity and form and function are specified if not readily transparent.
- Language-specific generalizations across constructions are captured via inheritance networks, reflecting commonalities or differences among constructions.
- Constructions are understood to be learned on the basis of the input and general cognitive mechanisms.

Generalizations about particular constructions, analogous to those about words, are expressed in terms of constraint inheritance in a multiple inheritance type hierarchy. This view partitions the linguistic sign into subtypes according to its headedness and clausality. The hierarchy in (42) represents how headedness is further subpartitioned.



Phrases are classified into *headed-cxt* and *non-headed-cxt*, each type exhibiting its own subtypes. For instance, these two general constructions obey general constructions like the Head Feature Principle.

(43) Head Feature Principle:

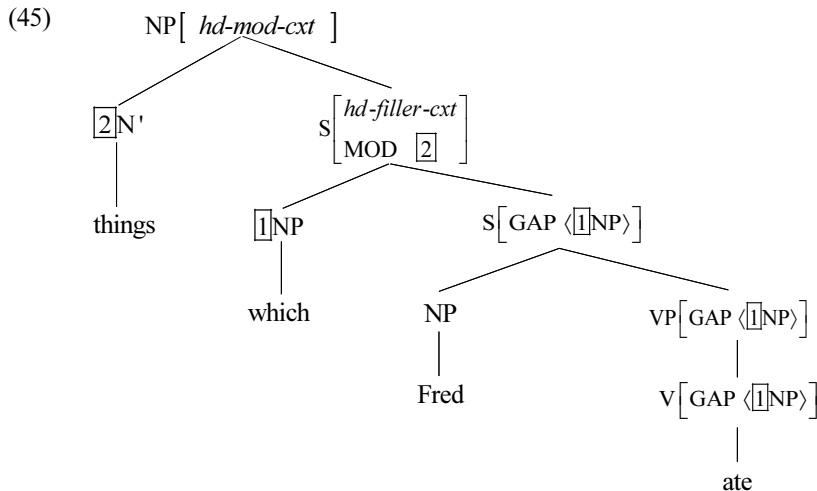
$$\begin{bmatrix} hd\text{-}cxt \\ MOD \quad \boxed{1} \end{bmatrix} \rightarrow H[HEAD \quad \boxed{1}], \dots$$

The HFP in (43) guarantees that the head features of a head construction (e.g, part-of-speech (POS), case (CASE), and vform (VFORM)) values are identical with those of its head daughter. This general constraint will be inherited to its subconstructions including the *head-filler-cxt* which has its own constructional constraints:

(44) Head-Filler Construction:

$$S \begin{bmatrix} head\text{-}filler\text{-}cxt \\ GAP \langle \quad \rangle \end{bmatrix} \rightarrow \boxed{1}XP, S[GAP \langle \boxed{1}NP \rangle]$$

This construction rule says that when a head expression S containing a nonempty GAP value combines with its filler value, the resulting phrase will form a grammatical head-filler phrase with the GAP value discharged, completing the ‘top’ of the long-distance or unbounded dependency. Consider a typical relative clause example (Sag 1997, Kim 2016):

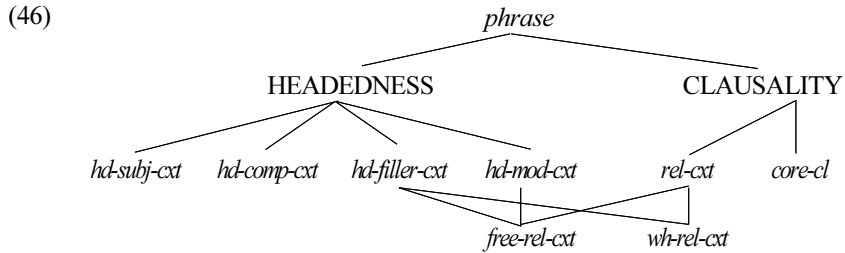


The sentence *Fred ate* with an NP gap combines with the NP filler *which*, forming

a head-filler construction. This construction in turn modifies the nominal *things*, yielding a head-modifier construction.

## 7.2 Cross-classified free relative construction

We have seen that free relatives have both nominal and clausal properties. This paper attributes the mixed properties of the constructions to its constructional status, as represented in the following revised hierarchy.



As given here, English independently employs the *free-rel-ctx*, which is a subtype of both *hd-filler-ctx* and *hd-modifier-ctx*. Within a multiple inheritance hierarchy system the construction *free-rel-ctx* thus bears all the constraints inherited from these two supertype phrases while carrying its own construction-specific constraints given in the following:

(47) Free Relative Construction:

$$\left[ \begin{array}{l} \textit{free-rel-ctx} \\ \text{SYN|POS } \boxed{1} \end{array} \right] \rightarrow \text{H} \left[ \begin{array}{l} \text{SYN|POS } \boxed{1} \\ \text{FREL } \textit{neset} \end{array} \right], \text{S}$$

The free relative construction requires its categorial feature (POS) to be identified with that of the head *wh*-phrase. The *wh*-phrase also bears the nonlocal FREL feature, excluding examples like *why he ate* from the free relative.<sup>2</sup> The construction,

2 Only a limited set of *wh*-words bears the FREL feature. For instance, *why*, and the determiner uses of *which* and *whose* do not bear the feature, as evidenced from the following:

- (i) a. \*Kim solved the puzzle why Kim solved it.  
 b. \*Lee bought which car Kim wanted to sell to him.

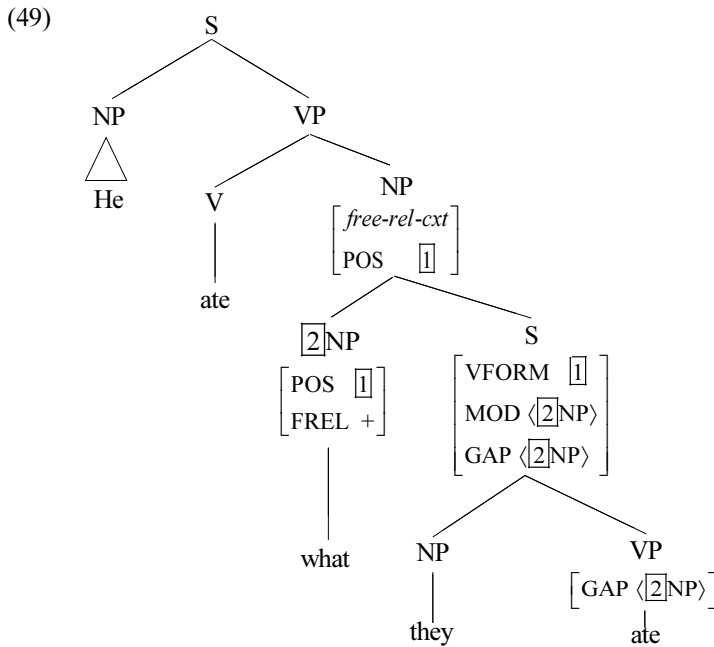


inheriting the constraints from its super-constructions of head-filler and head-mod constructions, eventually carries the following constraints:

(48) Free Relative Construction:

$$\begin{bmatrix} \textit{free-rel-ctx} \\ \text{SYN|POS } \boxed{1} \end{bmatrix} \rightarrow \boxed{2}\text{H} \begin{bmatrix} \text{SYN|POS } \boxed{1} \\ \text{FREL } \textit{neset} \end{bmatrix}, \text{S} \begin{bmatrix} \text{MOD } \boxed{2} \\ \text{VFORM } \textit{fin} \\ \text{GAP } \langle \boxed{2}\text{XP} \rangle \end{bmatrix}$$

The constraints in the shaded parts are inherited from its superconstructions. The head-filler construction requires the non-head clause to carry a nonempty GAP value whose syntactic information matches with the filler head with the feature FREL. The head-modifier construction ensures that the clause modifies the head FREL phrase. These constructional constraints then license a structure like the following:



Being a subtype of a *head-filler-ctx* ensures the matching condition between the filler

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The *wh*-expressions *why* and *which* are lexically specified to bear no FREL feature.

and the head, blocking sentences like (50):

- (50) a. \*Lee bought [<sub>NP</sub> [<sub>NP</sub> what] [<sub>S/NP</sub> Kim wanted to remind him [<sub>PP</sub> \_\_ ]]].  
 b. \*I will live [<sub>PP</sub> [<sub>PP</sub> in whatever town] [he lives in [<sub>NP</sub> \_\_ ]]].

In these examples, the syntactic category of the *wh*-phrase mismatches with that of the gap in the clause. Since *head-filler-ctx* independently requires the phrase to be finite, the clause also disallows to be infinitival:

- (51) a. \*Tom always wears what to wear.  
 b. \*Tom will do whatever to satisfy her.

Since the *free-rel-ctx* is also a subtype of a *rel-ctx*, we expect both share certain properties:

- (52) a. Tom ate [what [he ate]].  
 b. Tom ate [the thing [that he ate]].

The clauses in both constructions are sentential modifiers involving a relative clause. The only difference is that the free relative does not have an overt antecedent and it is rather hidden in the meaning of *what*.

In the present analysis, it is the FREL phrase itself that determines the syntactic category of the whole free relative. This blocks us from licensing non-matching cases:

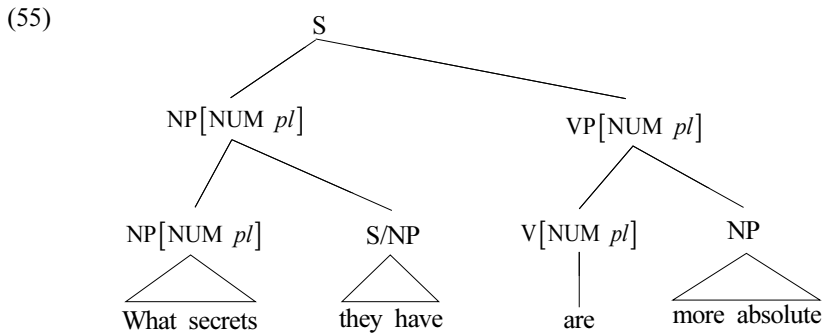
- (53) a. \*John will be [what you are selling].  
 b. \*I will put my books [however tall his father was].

The system where the *wh*-phrase functions as the head of the construction also predicts the number agreement between the verb and the FREL phrase:

- (54) a. [[What beauty insiders] you use] are eyebrow shavers. (COCA 2014 SPOK)  
 b. [[What secrets] they have] are more absolute, because they care so

- little whether we care for them. (COCA 1997 ACAD)  
 c. [[What dreams] I had] were all in black and white and took place  
 in the new unknown city. (COCA 1990 MAG)

The partial, simple structure of (54b) would be something like the following in the present analysis:



The structure represents the agreement between the subject's NUM value is identical with that of the VP.

### 7.3 Capturing mismatching effects

Let us reconsider mismatching examples:

- (56) a. Let us find [where you want to raise the bar].  
 b. Google's new goal is to predict [when you get sick].

As we have seen, the matrix predicates *find* and *predict* require the free relative to be an NP, but the relative is headed by *where* and *when* here, each of which is presumably linked to a PP gap.

Note that nominal expressions such as *moment*, *day*, *week*, *yesterday*, *place*, *direction* and so forth are categorically NPs though exhibiting distributional parallels with other adverbial categories (see Larson 1985):

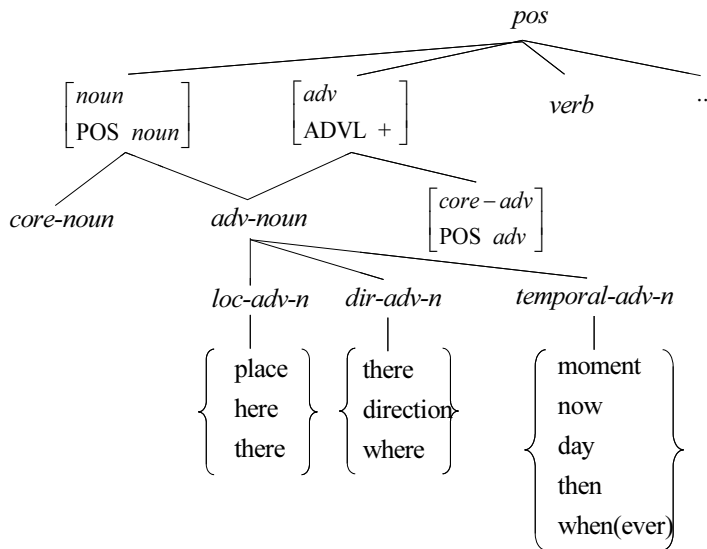
- (57) a. John arrived [that moment/at 9].  
 b. You have lived [some places warm and sunny/in a sunny town].  
 c. We were headed [that direction/for the village].

The class of these bare-NP adverbs are lexically determined since expressions like *vacation*, *location*, and *course* behave differently in the sense that these obligatorily require proper prepositions.

- (58) a. John arrived \*(during) this vacation.  
 b. You have lived \*(at) some location near Seoul.

Given this, we could assume that there are two types of adverbs: *pure-adv* and *nominal-adv*, as represented in the following hierarchy:

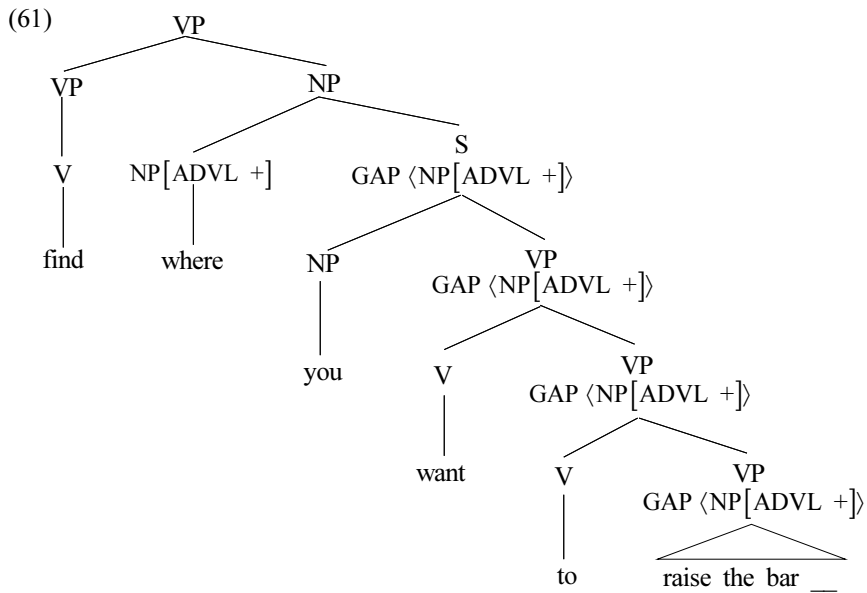
(59) Hierarchy for English parts-of-speech



What this hierarchy tells us is that the words belonging to the *adv-noun* type are cross-classified as a subtype of *noun* and *adverb*, bearing the following features:

$$(60) \quad \textit{adv-noun}: \begin{bmatrix} \text{POS} & \textit{noun} \\ \text{ADVL} & + \end{bmatrix}$$

Note that the *wh*-expressions *when* and *where* are also taken as an *adv-noun* bearing the ADVL feature which indicates whether it can modify a verbal expression. This means *adv-noun* is categorically a noun bearing the feature ADVL which can function as a modifier. The type *core-noun* does not bear this ADVL feature. This would then assign the following structure to examples like (56):



As seen from the structure, the *wh*-phrase, *where*, is categorically an NP bearing the positive ADVL feature. This matches with the gap in the clause. The gap could be an AdvP or a PP, but this would not match with the filler *where*. Note that the present analysis offer a uniform analysis for examples like the following:

- (62) a. Tom stayed [where Mary had wanted to stay].  
 b. Lily cried [when Jack had to go].

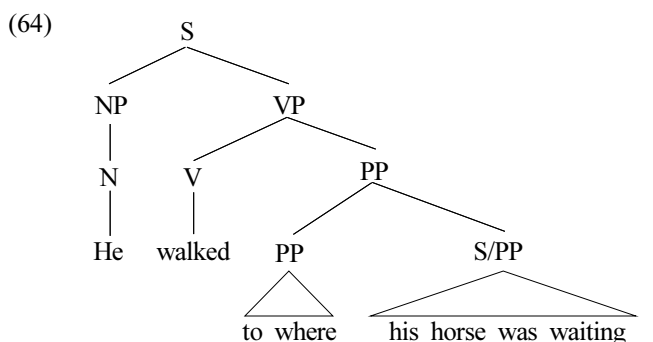
In these examples, *where* and *when* also carry the ADVL NP matching with the

putative gaps. There is thus no violation in the matching condition.

The mismatch effect we have seen so far concerns mismatches in the categorical information. Note a different mismatch observed in the following corpus data (see Bresnan and Grimshaw 1978 too).

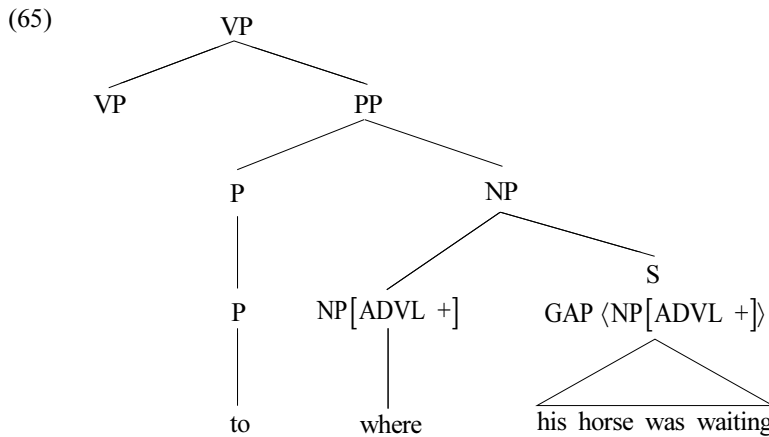
- (63) a. He walked to [*where* his horse was waiting]. (COCA 1994 MAG)  
 b. Using a pointer Carbonell pointed to [*where* she and her children were sitting]. (COCA 2015 NEWS)  
 c. Why we would consider returning to [*where* we were] when there is no obvious reason to do so is a mystery to me. (COCA 2015 NEWS)

Note that the Head analysis could assign a structure like the following for (63a):



Even if we allow *to where* as a constituent, this directional PP does not match with the putative gap which is a locative one.<sup>3</sup> Note that the present analysis would not assign such a structure, given that ADVL expressions like *where* do not form a constituent with the preposition. The present analysis can account for these example as we have done for examples like (56) in which *where* and the putative gap are taken to be an NP with the positive ADVL feature, as illustrated in the following.

<sup>3</sup> Another possible analysis is to take *where* to be a PP matching with the putative PP gap. This would mean that *where* belongs to a preposition, in addition to a *adv-noun*.



The putative gap is an ADVL NP which matches with the filler *where*. There is thus no mismatching arises in the present system.

Note that the present account needs to posit no empty preposition as postulated by Caponigro and Lisa (2009):

- (66) a. Lily adores [<sub>CP</sub> [<sub>NP</sub> where] this very tree grows [<sub>PP</sub> [<sub>P</sub> e] [<sub>NP</sub> \_\_\_ ]]].  
 b. Lily napped [<sub>PP</sub> [<sub>P</sub> e] [<sub>CP</sub> [<sub>NP</sub> where] this very tree grows [<sub>PP</sub> [<sub>P</sub> e] [<sub>NP</sub> t]]]].

Leaving aside the justification for positing such empty prepositions, we can observe the complexity that such an abstract analysis brings us. The present system is much simpler than this one where expressions like *where* and *when* are NPs as the complement of a silent P.

## 8. Conclusion

English free relatives display sentential properties in their internal syntax but carry nominal properties in their external syntax. These mixed properties distinguish free relatives from interrogative clauses (indirect questions). English free relatives are also intriguing in their matching as well as mismatching effects linked to the *wh*-phrase, the free relative required by a head, and the putative gap.

This paper has discussed these mixed properties as well as (mis)matching effects while referring to authentic data. It then has offered a construction-based analysis that can account for all these. In doing so, it has argued for the existence of the free relative construction bearing its own constructional constraints as well as those inherited from the related constructions including head-modifier as well as head-filler constructions, which are all linked within the inheritance network system. This has allowed us to capture generalizations as well as idiosyncracies about English free relative clause constructions in a systematic way.

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