Constructional Constraints in English Free Relative Constructions

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Jong-Bok Kim. 2001. Constructional Constraints in English Free Relative Constructions. *Language and Information 5.1*, 35–53. As a subtype of English relative clause constructions, free relative constructions like *what John ate* in *I ate what John ate* exhibit complicated syntactic and semantic properties. In particular, the constructions have mixed properties of nominal and verbal: they have the internal syntax of sentence and the external syntax of noun phrase. This paper provides a constraint-based approach to these mixed constructions, and shows that simple constructional constraints are enough to capture their complexities. The paper begins by surveying the properties of the constructions. It discusses two types (specific and nonspecific) of free relatives, their lexical restrictions, nominal properties, and behavior with respect to extraposition, piped piping, and stacking. Following these, it sketches the basic framework of the HPSG (Head-driven Phrase Structure Grammar) which is of relevance in this paper. As the main part, the paper presents a constraint-based analysis in which tight interactions between grammatical constructions and a rich network of inheritance relations play important roles in accounting for the basic as well as complex properties of the constructions in question. **(Kyung Hee University)**

1. Properties of Free Relatives

1.1 Basic Properties

There exist at large two types of free relative constructions in English as illustrated in (1) and (2) (Baker 1989, Quirk et al. 1985):

(1) a. I eat [what I like].
b. Kim read [what book I bought].
c. Here is [where I bought the book].
d. Now is [when I need you].

(2) a. Kim will do [whatever you tell him to do].
b. Kim will read [whichever book you buy for him].
c. Kim got the tapes from [wherever he keeps his books].

One main difference between types in (1) and (2) comes from semantics. In the free relatives (1), we can identify the entity or location the free relatives refer to. But in those *wh-ever* free relatives (2), we cannot identify the entity or location they refer to. In this

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respect, following Quirk et al. (1985), we will refer to free relatives like (1) as 'specific' and those like (2) as 'nonspecific' free relatives.[1]

Like interrogative constructions or relative clause constructions, free relatives use *wh*-elements. But the range of possible *wh*-words in free relatives is much more restricted. Specific free relatives introduce only *what, where*, and *when*: the *wh*-words *who, which*, or *how* cannot occur in specific free relatives (Baker 1989, Borsley 1992, Quirk et al. 1985.):

(3) a. He got **what** he wanted.
b. He put the money **where** Lee told him to put it.
c. The concert started **when** the bell rang.

(4) a. *Lee wants to meet **who** Kim hired.
b. *Lee bought **which** car Kim wanted to sell to him.
c. *Lee solved the puzzle **how** Kim solved it.

Further, the contrast in (5) demonstrates that unlike interrogative constructions, free relatives do not allow the genetive *wh*-word *whose*, either.

(5) a. I will ask **whose** books he is selling.
b. *I will buy **whose** books he is selling.

Nonspecific free relative clauses are different from specific relatives in that they allow most of the *wh*-words:

(6) a. Lee will say **whatever** you tell him to say.
b. Lee will read **whichever** book you buy for him.
c. Lee dances with **whoever** asks her to dance.
e. I will put my books **wherever** you put yours.
g. She wrote **whenever** it is possible.

But the *wh*-words, *why* and *whose* cannot appear in such nonspecific free relatives, as illustrated in the following examples:

(7) a. *You should help me **whyever** you help those deadbeat drinking companions of yours.
b. *I will buy **whosever** books he is selling.

1.2 Sentential-like Properties

Unlike these semantic and lexical differences, the two types of free relatives have similar syntactic structures. A close examination reveals that these free relative constructions all have bipartite structures: a *wh*-element and an incomplete sentence with a missing phrase (cf. Baker 1989):

1. Grosu (1996: 260-261) points out that *wh-ever* free relatives can have a definite reading as shown in (i):

(i) a. John is speaking with whatever applicant his secretary called the day before.
b. John is now digging with whatever tool Mary handed him a moment ago.

Even with the word *ever* absent, free relatives can have a universal reading, when the clause is in the future tense.

(ii) I will visit who you visit.

(8) a. Kim ate [what [Lee offered __ to her]].
b. [What [Kim fixed __ for Lee]] went into the trash.

(9) a. Kim will do [whatever [you tell him to do __]].
b. Kim will read [whichever book [you buy __ for him]].

The second part of the bracket alone is an incomplete sentence with a missing element. This missing element is syntactically linked to the first part with a free relative *wh*-word. Further we can observe here that like interrogative constructions but unlike relative clauses, free relatives have no antecedent relations with any element either within themselves or within the given sentence.

1.3 Nominal Properties

1.3.1 Nominal Distribution. With respect to distributional possibilities, free relatives externally act like nominal clauses. They appear in the contexts where otherwise only NPs can occur (Bresnan and Grimshaw 1978, Quirk et al. 1985):

(10) a. [Whoever did that] should admit it frankly.
b. I took [what they offered me].
c. Macy's is [where I buy my clothes].

Free relatives in (10) function as the subject, object, or predicative complement. They can serve even as prepositional complements:

(11) a. I will move to [wherever you want to live].
b. John got the tapes from [wherever he keeps his books].

1.3.2 Number Agreement. Another nominal nature of free relatives comes from agreement. Let's compare the agreement factors in interrogative, relative, and free relative clauses, respectively:

(12) a. **What books he has written** isn't/*aren't certain.
b. **The books** Kim has written *hasn't/haven/t been published.
c. **What(ever) books** he has written *hasn't/haven't been sold well.

In interrogative constructions (12)a, it is the whole interrogative subject NP that determines the grammatical number of the main verb. But in relative clauses (12)b, it is the head NP *the books* that induces number agreement with the main verb. In free relatives (12)c, it is not the whole subject phrase but just the *wh*-expression, *what(ever) books*, that induces agreement with the main verb. This implies that the head of the free relative construction is the noiminal phrase with the *wh*-free-relative word as its specifier (Bresnan and Grimshaw 1978, McCawley 1981, Quirk et al. 1985).[2]

2. In addition to the differences in the set of available *wh*-words between interrogative and free relative constructions, they differ in that the occurrence of indirect questions depends on the types of predicates, whereas that of free relatives does not.

(i) a. *Kim ate which dish Lee served to her.
b. Kim knew which dish Lee served to her.

(ii) a. *Which dish Lee served to her went into the trash.
b. Which dish Lee served to her was unclear.

As observed, the predicates, *know* and *unclear* allow indirect questions as complements, but *ate* and *went* do not.

1.4 Other Main Properties

1.4.1 No Extraposition. Free relatives clauses also behave differently from interrogative complements with respect to extraposition (cf. Bresnan and Grimshaw 1978). Let us observe the contrast:

(13) a. [How much he bought] isn't important to us.
b. It isn't important to us [how much he bought].

(14) a. [What Edward offered to her] went into the trash.
b. *It went into the trash [what Edward offered to her].

Examples in (13)a and (13)b show that a subject indirect question can also appear as a pseudocomplement linked to the substitute subject *it*. However, the ungramaticality of (14)b tells us that the subject free relative cannot undergo *it*-extraposition.

1.4.2 No Pied Piping. Pied piping is another phenomenon where we can observe a peculiar property of free relatives (cf. Bresnan and Grimshaw 1978). Compare the pied piping in relative, interrogative, and free relative constructions, respectively:

(15) a. I will read the paper [which Kim is working on].
b. I will read the paper [on which Kim is working].

(16) a. I'd like to know [which paper Kim is working on].
b. I'd like to know [on which paper Kim is working].

(17) a. I'll reread [whatever paper Kim has worked on].
b. *I'll reread [on whatever paper Kim has worked].

Examples in (15) and (16) show that English relative clauses as well as interrogative clauses allow a preposition to be preposed along with the *wh*-phrase. But this is not possible in free relatives as seen in (17): it is ungrammatical to displace the preposition from the base position, as observed from (17)b.

1.4.3 No Infinitival Free Relative Clauses. Another interesting behavior of free relatives relates to their finiteness. Interrogative clauses can be either finite or nonfinite as shown in (18) (cf. Baker 1989).

(18) a. I wonder who I should place my trust in.
b. I wonder who(m) to place my trust in.

In contrast, free relatives allows only finite clauses:

(19) a. Kim always wears [what he should wear].
b. *Kim always wears [what to wear __ .]

(20) a. Kim always wears [whatever he should wear __ .]
b. *Kim always wears [whatever to wear __].

Examples in (19) and (20) here show that both specific and nonspecific free relatives can be based only on finite clauses.

1.4.4 Stacking and Ordering. Restrictive *wh*-relatives or *that* relatives can be iterated, but bare-relatives, if there are any, must be the first member of any such iteration, as shown in the following examples (cf. Weisler 1980, Sag 1997):

(21) a. The book [that Kim bought __] [that Lee wrote __] was boring.
b. The books [Kim bought __][that Lee wrote __] were boring.
c. *The book [that Kim bought __][Lee wrote __] was boring.

Free relatives, in particular, non-specific relatives also show certain restrictions in stacking. Nonspecific free relatives can be modified by restrictive relative clauses with *wh*-relative words (cf. Weisler 1980):[3]

(22) a. I will read [whatever you recommend __] [that Kim wrote __].
b. I bought [whatever you sold __][that my wife thought we could afford __].

But, it is not possible for *wh*-less reduced relatives to modify nonspecific free relatives:

(23) a. *I will read [whatever you recommend __] [Kim wrote __].
b. *I bought [whatever books Mary recommended __][I could afford __].

1.5 Summary

So far we have observed various properties of free relative constructions. In terms of lexical properties, free relatives incorporate a limited set of *wh*-words. As far as their external syntax is concerned, they exhibit NP properties, supported by their distributional and number agreement facts. With respect to extraposition and piping, free relatives behave differently from interrogative constructions. Finiteness and stacking facts again distinguish free relatives apart from interrogatives and restrictive relatives. In what follows, we offer an analysis accounting for these properties within the framework of a constraint-based grammar.

2. Background and Basics of the Constraint-Based Analysis

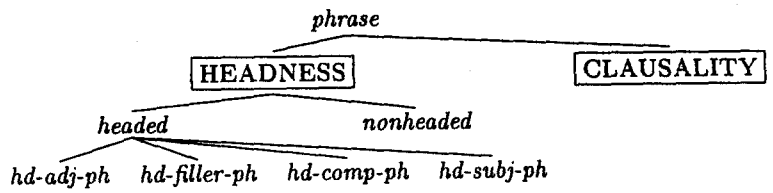
Our treatment of English free relatives is couched in the constraint-based framework of HPSG one of whose theoretical foundations lies in the utilization of multiple inheritance. The inheritance mechanism, armed with hierarchical classifications of linguistic objects, has been incooperated by earlier work in HPSG (e.g. Pollard and Sag 1987) to eliminate redundancies in the structure of the lexicon. The concept of hierarchical classification is essentially assigning words to specific types (formally termed sorts), and an assignment of those types to superordinate types (supersorts). Each type is declared to obey certain constraints corresponding to properties shared by all members of that type. The technique of hierarchical inheritance further ensures that a type inherits all the constraints of its supertypes. Thus a word assigned to a type obtains all the constraints associated with its supertypes, in addition to its own constraints. This system then allows us to express cross-classifying generalizations about words, while accommodating the idiosyncracies of individual types on particular subtypes of words.

3. Unlike nonspecic free relatives, specific free relatives do not allow stacking, even if modified by a *wh*-relative clause.

(i) a. ??I am going to do [what Lee wants __] [that I'm able to do __].
b. *? I am going to do [what Lee wants __] [I'm able to do __].

The same general method has been applied to the grammar of phrases, e.g., to English relative clauses by Sag 1997 and to English interrogative constructions by Ginzberg and Sag 2001. These analyses exploit the power of multiple inheritance hierarchies in factoring out dependency relations and clausal functions into distinct informational dimensions. Under these proposals, 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 headness and clausality. The hierarchy in (23) represents how headness is further subpartitioned.

(24)



Phrases are classified into *headed-ph* and *non-headed-ph*, each type exhibiting its own subtypes. These two phrase types obey type-specific constraints. The two general constraints that the type headed-phrase obeys are Head Feature Principle and Valence Principle.

(25) Head Feature Principle (To be revised):

$$\textit{hd-ph} \Rightarrow \begin{bmatrix} \text{HEAD} & \boxed{1} \\ \text{HD-DTR} & \begin{bmatrix} \text{HEAD} & \boxed{1} \end{bmatrix} \end{bmatrix}$$

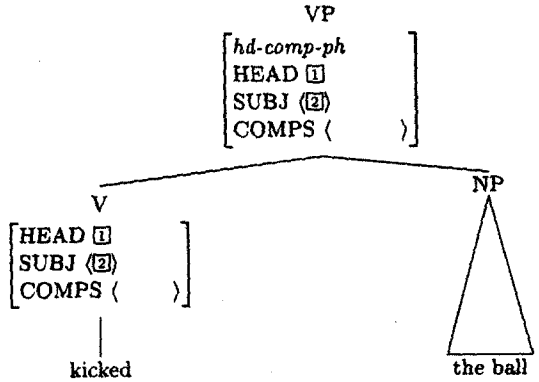
The HFP in (25) guarantees that a phrase's grammatical properties such as part-of-speech, case, and form class is identical with those of its head daughter. Another principle that all instances of headed-phrases obey is the Valence Principle (VALP), which is formulated as a constraint:

(26) Valence Principle:

$$\textit{hd-ph} \Rightarrow \begin{bmatrix} \text{SUBJ} & / \boxed{1} & \\ \text{SPR} & / \boxed{2} & \\ \text{COMPS} & / \boxed{3} & \\ \text{HD-DTR} & \begin{bmatrix} \text{SUBJ} & / \boxed{1} \\ \text{SPR} & / \boxed{2} \\ \text{COMPS} & / \boxed{3} \end{bmatrix} & \end{bmatrix}$$

This principle states that a phrase's value for a valence feature is identical to that of the phrase's head daughter, unless it is an instance of some more specific subtype of *hd-ph* that says otherwise (e.g. *hd-comp-ph* has its own constraint that its COMPS value is discharged after combining with its complements.) Because these two general principles are constraints on the type *hd-ph*, all its subsorts should observe this constraint also. For example, let us look at one VP example, *kicked the ball.*

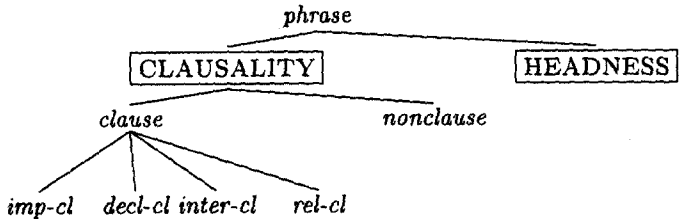
(27)



The phrase *kicked the ball* is a *hd-comp-ph* which is a subtype of *hd-ph*. This phrase thus must obey the two general constraints: the HFP in (25) and the VALP in (26). We see here that the VP's **HEAD** value is identical to its head-daughter, and that its valance feature SUBJ is identical with its head-daughter's value. But its COMPS value is discharged in accordance with *hd-comp-ph*'s own specific constraint. This conforms to the principle VALP.

In a similar manner, phrases are also classified according to the value of clausality.[4]

(28)



One general constraint that governs all instances of *clause* is given in (29).

(29)

$$clause \Rightarrow \begin{bmatrix} \text{SUBJ } \textit{list(PRO)} \\ \text{HEAD} \mid \text{MOD } \textit{none} \\ \text{REL} \{\ \} \\ \text{QUE} \{\ \} \end{bmatrix}$$

This constraint at first requires that the SUBJ value of a clause be an empty list or PRO, blocking phrases such as **Kicked the ball* from realizing as a clause. The constraint

4. The constraint on the type *hd-comp-ph* can be represented as in (i):

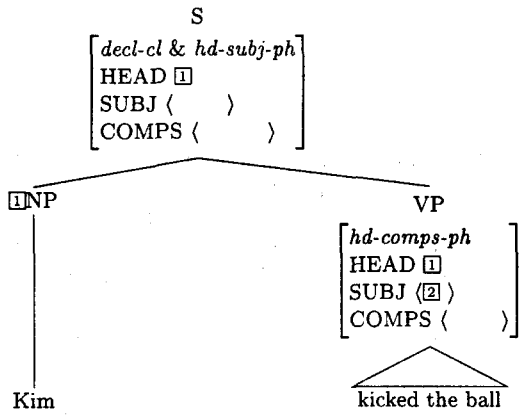
(i) $\begin{bmatrix} \text{COMPS } 2 \\ \text{HD-DTR} \mid \text{COMPS} \begin{bmatrix} \text{FIRST } 1 \\ \text{REST } 2 \end{bmatrix} \\ \text{NON-HD-DTR} \mid \text{SYNSEM } 1 \end{bmatrix}$

This constraint says that a phrase's COMPS value is the one the head daughter's COMPS value minus the discharged complement.

further declares that the expression belonging to a *clause* should have no MOD value. It further states that all clauses have an empty REL and QUE value. This specification rules out examples such as **Kim kicked whose ball.* Any expression, which is an instance of clause, is thus subject to this constraint. Given this multidimensional organization of phrasal types, each type of phrase is cross-classified. Individual phrase types inherit both from a CLAUSALITY type and a type of HEADNESS.

Let us then briefly see how this system works for a sentence like *Kim kicked the ball.*

(30)



The sentence, *Kim kicked the ball,* is an instance of the type declarative clause as well as of the *hd-subj-ph.* This implies that this sentential clause should obey all the constraints imposed on these two. The sentence first observes both the HFP and VALP: the SUBJ value of its head daughter VP is identical with the subject daughter's SYNSEM value. The feature structure of the top S is a *clause,* observing the contraint in (29). This mode of analysis, expressing generalizations about phrases with multidimensions, lays out a brief picture of how various kinds of factored information is interwoven together in grammar. Constructionl information, represented as declarative constraints, restricts the possible combination of syntactic units. The structure of a phrase or clause is, thus, determined from the interaction of the lexical properties of the head and the constraints on the construction type in question.

3. A Constraint-Based Analysis

3.1 Lexical Entries

We have observed that the *wh*-words that can occur as free-relatives is basically different from the ones that can appear in restrictive relatives. For example, the only possible *wh*-words that can occur in specific free relatives are *what, why,* and *where.* Reflecting these lexical restrictions, we distinguish free relatives *wh*-words from the others in that the former bears nonempty specifications for the feature F(REE)-REL which takes a set of referential indices as its value (Jacobson 1976, Kim and Park 1996):[5]

5. We assume that the nonlocal feature REL is further partitioned into three types.

(31)
$$\begin{bmatrix} \langle \text{what} \rangle \\ \text{CAT NP} \\ \text{CONTENT} \mid \text{INDEX } \boxed{1} \\ \text{F-REL } \{\boxed{1}\} \end{bmatrix} \qquad \begin{bmatrix} \langle \text{whatever} \rangle \\ \text{CAT NP} \\ \text{CONTENT (forall}\boxed{2}\text{(thing }\boxed{2}\text{))} \\ \text{F-REL } \{\boxed{2}\} \end{bmatrix}$$

The lexical information represents that *what* and *whatever* both have an nonempty F-REL value while the latter behaves like a universal quantifier.

We also assume that, like the other nonlocal features SLASH and WH, F-REL generated from a lexical entry is subject to the lexical amalgamation constraint as given in (32):

(32) Lexical Amalgamation of F-REL:

$$\textit{word} \quad \Rightarrow \quad \begin{bmatrix} \text{ARG-ST } \langle [\text{F-REL } \boxed{1}], \ldots, [\text{F-REL } \boxed{n}] \rangle \\ \text{F-REL } \boxed{1} \cup \ldots \cup \boxed{n} \end{bmatrix}$$

The constraint ensures that if any element of a lexical head has a F-REL value, the lexical head verb itself also has the same F-REL value. This lexical amalgamation simplifies the statement of the inheritance of F-REL specifications, combined with the extended Generalized Head Feature Principle in (33) (Ginzberg and Sag 2001):

(33) Generalized Head Feature Principle:

$$\begin{bmatrix} \textit{hd-ph} \\ \text{SYNSEM } /\boxed{1} \end{bmatrix} \quad \Rightarrow \quad \mathbf{H}\left[\text{SYNSEM } /\boxed{1}\right], \ldots$$

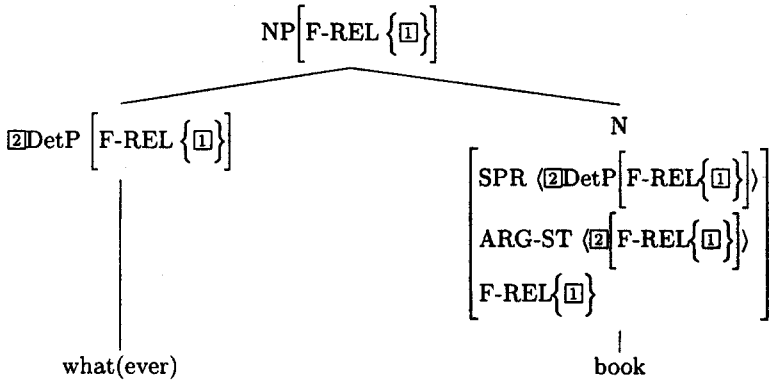
This general constraint indicates a default constraint requiring that the SYNSEM value of the mother of a headed phrase and that of its head daughter are identical by default (marked by /). This simplified constraint thus guarantees the inheritance of nonlocal features such as F-REL from a lexical head to its mother (e.g. from a verb to the VP and the S that it projects or from a noun to the NP) as shown in (34):

(i)
$$\begin{bmatrix} \text{REL} & \begin{bmatrix} \text{REST-REL} & \textit{set(index)} \\ \text{NON-REST-REL} & \textit{set(index)} \\ \text{F(REE)-REL} & \textit{set(index)} \end{bmatrix} \end{bmatrix}$$

There is supporting evidence that the lexical properties of wh-words determine the set of wh-words that can occur in each type of relative clauses. For example, non-restrictive relatives do not allow *that*:

(ii) *Mary, that John asked for help, thinks John is an idiot.

(34)

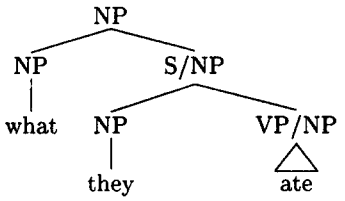


The lexical amalgamation prompts the lexical head to bear the feature F-REL. The GHPF ensures that this value is identical with that of the head NP.

3.2 General Constraints

Free relatives are instances of relative constructions in the sense that the whole phrase is basically a nominal phrase. We have observed that free relative constructions exhibit various nominal properties. In particular, the fact that the free relative *wh*-word, not the whole clause, induces the number agreement with the matrix verb leads us to assume that the preceding *wh*-element is the head of a noun phrase and the rest to be a modifier, as represented in (35).

(35)



This mode of structure tells us that free relative constructions are nominal constructions with two constituents: a free relative head NP phrase and a sentence whose missing element matches this free relative head (cf. Harbert 1983, Surner 1984). The construction is also a head-modifier phrase in the sense that the sentence with a missing element modifies the phrase with a free-relative word. But in a different angle, the free-relative head serves as the filler of the missing element in the modifying sentence, forming a head-filler phrase. We claim that these dual functions of English free relative clauses are originated from the constructional constraints on *free-rel-ph* as given in (36):

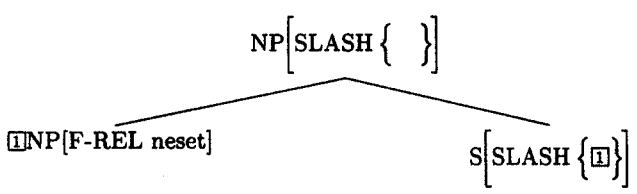
(36) Constraints on *free-rel-ph*:

$$[\,] \Rightarrow \boxed{2}\mathbf{H}\begin{bmatrix}\text{HEAD noun}\\ \text{LOC } \boxed{1}\\ \text{F-REL } \textit{neset}\end{bmatrix}, \quad \begin{bmatrix}\text{HEAD}\begin{bmatrix}\text{MOD } \boxed{2}\\ \text{VFORM fin}\end{bmatrix}\\ \text{SLASH } \{\boxed{1}\}\end{bmatrix}$$

What this constructional constraint says is that if something is a ***free-rel-ph***, it has two sisters: a head-daughter whose F-REL value is nonempty and a non-head-daughter

modifying this head-daughter (as represented by the feature MOD). One thing to notice is that the SLASH value of the non-head-daughter (missing element) is identical with that of the head-daughter (1), as observed earlier. This constraint reflects that the phrase is a kind of *head-filler* phrase. This analysis would then generate the following as a canonical structure of free-relative phrase construction:

(37)



The constructional constraint in (36) explains the unacceptability of non-subject-free relative constructions like (38):

(38) a. *Lee wants to meet [**who** [Kim hired]].
b. *Lee bought [**which car** [Kim wanted to sell to him]].
c. *I will buy [**whoseever** books [he is selling]].

These are all ruled out simply because the clause modifies a *wh*-word whose F-REL value is empty. According to the constraint in (36), the NP that the clause modifies must have a non-empty F-REL value.

Another general constraint on free relatives is about finiteness represented by the VFORM value. We have observed earlier that both specific and nonspecific relative clauses are subject to another constraint that no nonfinite clause is allowed.

(39) a. *Tom always wears what to wear.
b. *Tom always wears whatever to wear.

This prediction naturally follows from the assumption that free relative constructions are a kind of bare-relative clauses. We could observe that the identical constraint applies to bare-relative and *wh*-subject relative clauses:

(40) a. *[All [to read __]] can be found in this library.
b. *[A student [whom to talk to us]] just walked in.

We thus are able to draw out general constraints on both bare-relative clauses and free relatives, the constraints that instances of these must have [VFORM fin].

As the constraint specifies, the common property these free-relatives carry is that the clause has a missing element. Note also that the constraint guarantees that structure-sharing relation between the local value of the missing element and that of the *wh*-free relative word. This restrictions blocks sentences like (41):

(41) a. *Tom did [[when] they did [__]].
b. *Now is [[what] I need you [__]].

As represented in (42), the constraint ensures that the missing element matches the head phrase with a free relative word (Hirschbühler and Rivero 1983):