Abstract

In HPSG relative clauses have been analyzed in terms of phonologically empty heads in Pollard and Sag (1994) and in terms of a complex system of phrase types in Sag (1997). Modern Standard Arabic has a distinction between relative clauses with a definite antecedent, which are introduced by a special complementizer, and relative clauses with an indefinite antecedent, which are ‘bare’ clauses. Analyses eschewing empty heads and assuming a complex system of phrase types face a number of problems. An analysis in which relatives with an indefinite antecedent are headed by a phonologically empty complementizer is more satisfactory. Thus, in the case of Arabic, the approach of Pollard and Sag (1994) seems preferable to the approach of Sag (1997).

1 Introduction

Pollard and Sag (1994: Chapter 5) develop an analysis of relative clauses employing a number of phonologically empty heads. Sag (1997) rejects empty heads and instead makes use of a complex system of phrase types. Thus, for any language, major questions about relative clauses are:

• What phrase types are necessary?
• Are any empty heads necessary?

In this paper we will consider the implications of Modern Standard Arabic for these questions. We will argue that analyses which eschew empty heads face a number of problems and that an approach which employs an empty complementizer is more satisfactory.

2 The basic data

Arabic has two main types of finite relative clauses.\(^1\) With a definite antecedent a relative clause consists of the element \(\text{ʔallaði} \) and a clause containing either a gap or resumptive clitic, as in (1).

\[(1) \quad \text{a. jaʔa} \text{ l-walad-u } [\llad_{i} \text{ qaabala } ___ \text{ came.3.M.SG DEF-boy-NOM that. M.SG met.3.M.SG}]
\]

\(^1\) We are grateful to Bob Levine, Stefan Müller, the reviewers for the HPSG conference, and the audience for helpful discussion of the issues discussed here. Any deficiencies are our responsibility.

\(^1\) Arabic also has certain non-finite relatives, discussed e.g. in Melnik (2006). We will not consider how they should be analysed.
The boy who met the king came.

I found the book that Hind likes.

Here and subsequently we mark gaps by ‘___’ and place resumptive clitics in bold. ʔallaði is inflected for number, gender and case, and has the following forms:

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singular</td>
<td>ʔallaði</td>
<td>ʔallati</td>
</tr>
<tr>
<td>Dual-NOM</td>
<td>ʔallaðaani</td>
<td>ʔallataani</td>
</tr>
<tr>
<td>Dual-ACC/GEN</td>
<td>ʔallaðaynī</td>
<td>ʔallataynī</td>
</tr>
<tr>
<td>Plural</td>
<td>ʔallaðina</td>
<td>ʔallaati-allawaati</td>
</tr>
</tbody>
</table>

Table 1: Forms of ʔallaði

This makes it look like a pronoun. However, as we will see shortly, there is evidence that it is not a pronoun but a complementizer.

With an indefinite antecedent ʔallaði does not appear. We just have a ‘bare’ clause with either a gap or resumptive clitic, as in (2).

(2) a. jaaʔa walad-un [qaabala ___ l-malik-a] came.3.MSG boy-NOM met.3.MSG DEF-king-ACC ‘A boy who met the king came,’


Both definite and indefinite relatives are normally verb-initial, but subject-initial clauses sometimes occur.

Obviously, we must look more closely at the nature of ʔallaði. It agrees with the antecedent in number and gender. It also agrees with the gap or resumptive clitic since they agree with the antecedent. The following illustrate:
In (3a), \( \text{lla\dh} \) is masculine singular in agreement with the antecedent \( l\text{-walad-u} \), and the gap in subject position is also masculine singular, as shown by the associated verb. In (3b), \( \text{lla\dh} \) is masculine singular in agreement with \( l\text{-kitab-a} \), and the clitic \( hu \) is also masculine singular. The situation with case is different. The case of the antecedent and relativized position are not necessarily the same. Where they differ, \( \text{\textdah} \text{lla\dh} \) has the case of the antecedent and not that of the relativized position. Consider the following:

(4) a. ra\dhytu l-waladayni [lla\dhayni
saw.1.SG DEF-boy.DUAL.ACC that.M.DUAL.ACC
qaabala-\textit{humaa} l-malik-u]
met.3.M.SG-3.DUAL DEF-king-NOM
‘I saw the two boys whom the king met.’

b. jaa\da came.3.M.SG
lla\dh
qaabala-\textit{humaa} l-malik-u]
met.3.M.SG-3.DUAL DEF-king-NOM
‘The two boys whom the king met came.’

In (4a) the antecedent is accusative and the relativized position is also accusative. In (4b), the relativized position is again accusative, but the antecedent is nominative, and \( \text{\textdah} \text{lla\dh} \) agrees with it. This suggests that \( \text{\textdah} \text{lla\dh} \) is not a relative pronoun but a complementizer.

Further evidence for this conclusion comes from the fact that \( \text{\textdah} \text{lla\dh} \) is never part of a larger clause-initial phrase. Thus, for example, (5a) is ungrammatical. Instead we have (5b).

---

2 Aoun, Benmamoun and Choueri (2010) assume that \( \text{\textdah} \text{lla\dh} \) is a complementizer, but they provide no arguments for this position.

3 Sag (1997) assumes that English relative \textit{that} is a pronoun although it is never part of a larger phrase. He assumes that it cannot be part of a larger phrase because it is nominative. There is no possibility of taking a similar approach to \( \text{\textdah} \text{lla\dh} \) since it is not necessarily nominative.
Similarly, (6a) is ungrammatical, and instead we have (6b).

Thus, ʔallaði is quite different from an interrogative pronoun, which can be part of a complex clause-initial phrase, as the following show:

(7)  [pp maʔa  man] takallamta ___
    with who talked.2.M.SG
    ‘With whom did you talk?’

(8)  [np ʔom  man] ___ maatat
    mother who died.3.F.SG
    ‘Whose mother died?’

It is fairly clear, then, that ʔallaði is not a pronoun but a special inflected complementizer. Its main use is in relative clauses. It also appears in free relatives such as the bracketed examples in (9).

(9)  a. jaaʔa  [lləði ___ faaza fi
came.3.M.SG that.M.SG won.3.M.SG in
d-musabaqat-i]
def-competition-GEN
    ‘The one that won the competition came.’

      b. rəʔaytu  [llati ʔuhib-baa]
saw.1.SG that.F.SG like.1.SG-3.F.SG
    ‘I saw the one (female) that I like.’

We assume that such free relatives are NPs consisting solely of a relative clause. (See Alqurashi 2012.) We also find ʔallaði in certain wh-questions, such as (10).
We think that these may be headless clauses consisting of a wh-expression and a relative clause. Thus, it may well be that ‘allaði only appears in relative clauses. It does not appear in complement clauses, which are introduced by either ‘an or ‘anna, as the following illustrate:

(11) a. ‘iqtarhītu [‘an yušarīka Ahmad-un suggested.1.SG that participate Ahmad-NOM fi 1-musabaqah] in DEF-competition ‘I suggested that Ahmad participate in the competition.’


We conclude that ‘allaði is a special complementizer, probably used solely in relative clauses. A further point that we should note here is that relative clauses are rather like attributive adjectives. The latter also reflect the definiteness of the associated nominal, having the definiteness marker al- if the nominal is definite but not if it is indefinite. We have data like the following:


4 ‘an introduces a verb-initial clause, while ‘anna introduces a subject-initial clause with an accusative subject.

5 The restricted distribution of ‘allaði is highlighted by Ouhalla (2004). However, he sees it as evidence that it is not a complementizer but a determiner. We see no reason to adopt such a radical position.

In both cases they show agreement in number, gender and case. The similarity is unsurprising if both relative clauses and attributive adjectives are adjuncts modifying a nominal constituent.6

A final point that we should note before we seek to develop an analysis is that there is evidence from the distribution of gaps and resumptive clitics that they are similar elements. They behave alike with respect to the Coordinate Structure Constraint. Thus, it is possible to have a gap in one conjunct and a resumptive clitic in the other, as the following illustrates:

(13) l-fatatu [llati tu ibu ___ wa a_ras
ʕalay-ha] about-3.F.SG
‘the girl that I love and care about’

Within HPSG, this suggests that both are realizations of SLASH as in Taghvaipour’s (2004) analysis of Persian and that there is no need to invoke a separate RESUMP feature as in Vaillette’s (2000) analysis of Hebrew relative clauses.

3 Analyses without empty heads

In this section, we will consider the possibility of an analysis of Arabic relative clauses with no empty heads and a system of phrase-types along the lines of Sag’s (1997) analysis of English relatives. We will consider a number of analyses and argue that all face some important problems.

6 They differ in that adjectives precede while relatives follow a complement, as shown by the following:

(i) ?aT-Tariq-u l-jadiid-u ?ila r-riyadh-i
DEF-road-NOM DEF-new-NOM to DEF-riyadh-GEN
‘the new road to Riyadh’

(ii) ?aT-Tariq-u ?ila r-riyadh-i llaði yabnuna-hu
l-ʔaan
now
‘the road to Riyadh that they are building now’

The positioning of relatives is expected if they modify an NP. We will not try to deal with the positioning of adjectives.
An analysis of this kind will need a type $rel-cl$ with two subtypes $def-rel-cl$ and $indef-rel-cl$. Assuming $rel-cl$ is a subtype of $clause$, we will have the following type hierarchy:

\[
\begin{array}{c}
\text{clause} \\
\text{rel-cl} \\
\text{def-rel-cl} & \text{indef-rel-cl}
\end{array}
\]

We might propose the following constraint on $rel-cl$:

\[
rel-cl \Rightarrow \left[ \begin{array}{c}
\text{SLASH } \{} \\
\text{HD - DTR} \left[ \text{SLASH } \{\text{NP}[1]\} \right]\end{array} \right]
\]

This essentially combines the constraint on English relative-clauses proposed by Sag (1997: 444) and his constraint on English non-wh-relative-clauses (Sag 1997: 451). It ensures that a relative clause modifies an NP, that it is [SLASH {}], and that its head-daughter has a SLASH value containing an NP coindexed with the value of MOD. The SLASH Amalgamation Principle, which we formulate following Ginzburg and Sag (2000: 199) as (16), will ensure that an argument of the head has the same value.

\[
word \Rightarrow \left[ \begin{array}{c}
\text{SLASH } \{[1] \cup \ldots \cup [n]\} \\
\text{ARG - ST} \left< \{\text{SLASH } \{[1]\}, \ldots, \{\text{SLASH } \{[n]\}\} \right>\end{array} \right]
\]

This is a default constraint, which will be important later. The coindexing in (15) ensures that the modified NP and the gap or resumptive clitic agree in number and gender.

If we assume with Sag (1997) that complementizers are heads, definite relatives will be CPs, and we might propose the following constraints on the two subtypes of relative-clause:

\[
\begin{align*}
\text{(17)} \ a \ & \text{def-rel-cl} \Rightarrow \left[ \text{SS|LOC|CAT[HEAD } c] \right] \\
\text{b} \ & \text{indef-rel-cl} \Rightarrow \left[ \text{SS|LOC|CAT[HEAD } v] \right]
\end{align*}
\]

These will ensure that definite relatives are headed by a complementizer and indefinite relatives by a verb. Of course, definite relatives cannot be headed by just any complementizer. However, if no other complementizers are [MOD NP], only ʔallaði will be possible here.
Obviously we also need appropriate lexical descriptions for forms of ʔallaði and verbs. These need to ensure that definite relatives and indefinite relatives modify definite and indefinite NPs, respectively. They also need to ensure that they have the right semantics. We might propose that forms of ʔallaði have descriptions of the following form:

(18)

The various different forms will have different values for the NUMBER and GENDER and CASE features of the modified NP. Such descriptions ensure that a relative clause headed by ʔallaði modifies a definite NP and that its CONTENT value is a restricted index with restrictions stemming from its complement and the NP it modifies.

What about verbs? It looks as if we need to allow verbs to be [MOD NP[DEF −]] and to have a restricted index as their CONTENT value.

We assume that the combination of NP and relative clause is a head-adjunct-phrase, subject to the following constraint:

7 Following Kathol (1999), one might bring these features together as the value of an AGR feature. It is not clear to us whether this is necessary.
(19) \(hd-adj-ph\quad \Rightarrow\quad [DTRS<[1][SS[2]], [SS | LOC | CAT | HEAD[MOD[2]]]>]
\[\text{HD} - \text{DTR} [1]\]

This will give the following schematic structures for the complex NPs in (1a) and (2a) (where we assume with Levine and Hukari 2006 that gaps are empty categories):

(20)

\[
\begin{array}{c}
\text{NP} \\
[1] \text{NP}[2] \\
[\text{DEF} +] \\
\end{array}
\]

\[
\begin{array}{c}
\text{CP} \\
[\text{MOD}[1] \\
\text{SLASH} \{} \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
[\text{MOD}[1] \\
\text{SLASH} \{\text{NP}[2]\} \\
\end{array}
\]

\[
\begin{array}{c}
\text{C} \\
\text{NP} \\
\text{NP} \\
\end{array}
\]

(21)

\[
\begin{array}{c}
\text{NP} \\
[1] \text{NP}[2] \\
[\text{DEF} -] \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
[\text{MOD}[1] \\
\text{SLASH} \{} \\
\end{array}
\]

\[
\begin{array}{c}
\text{V} \\
[\text{MOD}[1] \\
\text{SLASH} \{\text{NP}[2]\} \\
\end{array}
\]

\[
\begin{array}{c}
\text{NP} \\
\text{NP} \\
\end{array}
\]

(20)

\[
\begin{array}{c}
\text{NP} \\
[1] \text{NP}[2] \\
[\text{DEF} +] \\
\end{array}
\]

\[
\begin{array}{c}
\text{CP} \\
[\text{MOD}[1] \\
\text{SLASH} \{} \\
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
[\text{MOD}[1] \\
\text{SLASH} \{\text{NP}[2]\} \\
\end{array}
\]

\[
\begin{array}{c}
\text{C} \\
\text{NP} \\
\text{NP} \\
\end{array}
\]

It looks as if the system of phrase types in (14), the constraints in (15) and (17), and appropriate lexical descriptions for forms of \(\text{	ext{́allaði}}\) and finite verbs can handle the data fairly well. However, this analysis has two dubious features. Firstly, it entails that verbs in indefinite relatives are [MOD NP]
unlike verbs elsewhere, which are [MOD none]. Since they look just the same as verbs in other contexts, this seems rather dubious. Secondly, it assigns different CONTENT values to verbs in indefinite relatives and verbs in other contexts. As Sag (1997: 474) notes

> There is no independent motivation for assigning a finite verb one kind of semantic content (a restricted index) when it appears as the highest verb in a relative clause and a completely different kind of interpretation (a proposition or qfposa) in all other contexts. Intuitively, finite verbs should have propositional content in all their uses …

Thus, the analysis seems rather unsatisfactory.\(^8\)

Sag (1997) avoids assigning special CONTENT values to verbs in English bare relatives by introducing a special head-relative-phrase subtype of head-adjunct-phrase subject to the following constraint:\(^9\)

\[
(22) \quad \text{hd-rel-ph} \Rightarrow \begin{bmatrix}
\text{HEAD noun} \\
\text{CONT} \begin{bmatrix}
\text{INDEX}[1] \\
\text{RESTR}[2] \cup \{[3]\}
\end{bmatrix} \\
\text{HD-DTR} \begin{bmatrix}
\text{INDEX}[1] \\
\text{RESTR}[2]
\end{bmatrix} \\
\text{NON-HD-DTRS} <[\text{CONT}[3] \text{proposition}]>
\end{bmatrix}
\]

On this approach the CONTENT value of a relative clause and hence the verb that heads it is a proposition. If we adopt this approach, verbs in indefinite relatives will no longer have a special CONTENT value.

What are the implications of this approach for definite relatives? There seem to be two possibilities. Firstly, we might assume that the combination of definite NP and definite relative is not an instance of head-rel-phrase. However, this seems counterintuitive. Secondly, we might assume that definite relatives and hence Ḥallaḍi have a proposition as their CONTENT value. This approach, however, assigns the same interpretation to Ḥallaḍi as other complementizers, and thus makes its restricted distribution rather surprising.

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\(^8\) If relative clauses have a restricted index, it will not be possible for them to be a subtype of clause if one assumes with Ginzburg and Sag (2000) that the type clause has the CONTENT message.

\(^9\) In Sag (1997) the internal structure of phrases is encoded by the features HD-DTR and NON-HD-DTRS. In more recent work, e.g. Ginzburg and Sag (2000), the latter is replaced by the feature DTRS.
Thus, definite relatives seem problematic for this approach. Notice also that it is still necessary within this approach to assume that verbs in indefinite relatives are [MOD NP] and not [MOD none]. Hence, this approach has some important weaknesses.

A rather different analysis is possible if we adopt the Generalized Head Feature Principle (GHFP) of Ginzburg and Sag (2000). In the preceding discussion we have assumed with Sag (1997) that a headed phrase and its head daughter have the same value for HEAD and that the CONTENT value of a headed phrase is the identical to that of the head daughter except in the case of a head-adject structure, where it is identical to that of the adjunct. The Generalized Head Feature Principle can be formulated as follows:

\[(23)\]

\[
hd-ph \Rightarrow \begin{cases}
\text{SYNSEM} / [1] \\
\text{HD - DTR} [\text{SYNSEM} / [1]]
\end{cases}
\]

It requires a headed phrase and its head daughter to have the same SYNSEM value by default. As a default principle it can be overridden. Hence, if we adopt this principle, we can assume that the MOD value of an indefinite relative is NP and the CONTENT value of an indefinite relative a restricted INDEX without assuming that verbs have these values. To do this we could replace (17b) by the following much more complex constraint:

\[(24)\]

\[
indef-rel-cl \Rightarrow
\]

\[
\begin{cases}
\text{SS} | \text{LOC} \\
\text{CAT} | \text{HEAD} \quad \begin{cases}
\text{MOD} \quad \begin{cases}
\text{LOC} \quad \begin{cases}
\text{CAT NP[DEF -]} \\
\text{CONT} \quad \begin{cases}
\text{INDEX[1]} \\
\text{RESTR [2]} \cup \{[3]\}
\end{cases}
\end{cases}
\end{cases}
\end{cases}
\end{cases}
\]

\[
\text{HD - DTR} [\text{CONT}[3]\text{proposition}]
\]

This ensures that indefinite relatives have a restricted INDEX as their CONTENT value and have a head daughter whose CONTENT value is a proposition. The GHFP will ensure that the head is a verb. The constraint also ensures that indefinite relatives modify an indefinite NP. Hence there is no need to associate this information with the verbs that head indefinite relatives and they can be [MOD none] like verbs elsewhere.

We need of course to ask about the implications of this approach for definite relatives. One possibility would be to retain the approach outlined
above, that is to have a very simple constraint on definite relatives and to attribute their main properties to the complementizer ʔallaði. This, however, would mean that we have radically different analyses for definite and indefinite relatives. An alternative would be to assume that ʔallaði like verbs denotes a proposition and is [MOD none]. We might propose descriptions of the following form:

(25) \[
\begin{array}{c}
\text{SS} \\
\text{LOC} \\
\text{CAT} \\
\text{COMPS} \\
\text{CONT}[3] \\
\text{NONLOCAL} \mid \text{SLASH}\{\text{NP}[1]\}
\end{array}
\]

We could then attribute the properties of relative clauses to a more complex constraint on relative clauses:

(26) \[
\text{rel-cl} \Rightarrow
\]

We could propose the following constraints on the two subtypes of relative-clause:
The problem with this approach is that there is nothing here to ensure that definite relatives are headed by ʔallaði and not other complementizers such as ʔan or ʔanna.

It looks, then, as if there are two main possibilities if we want to analyse Arabic relative clauses without invoking empty heads. One possibility is to treat definite and indefinite relatives in quite different ways. This seems unsatisfactory given that apart from the fact that one has an overt complementizer and the other doesn’t, they are quite similar. The other possibility is to assimilate verbs to ʔallaði or ʔallaði to verbs. The problem with the former approach is that it makes it quite surprising that verbs in relative clauses look just like verbs elsewhere. The problem with the latter is that it makes the restricted distribution of ʔallaði surprising.

4 An analysis with an empty head

We have seen that various problems arise for analyses of Arabic relatives like Sag’s (1997) analysis of English relatives, which avoid empty heads and employ a complex system of phrase types. It looks, then, as if we should consider an analysis more like Pollard and Sag’s (1994: Chapter 5) analysis of English relatives, one, that is, in which indefinite relatives are headed by a phonologically empty counterpart of ʔallaði. We will argue that this is more satisfactory than the approach we have just considered.

ʔallaði and its phonologically empty counterpart will of course have many properties in common, but this is no problem since we can treat them as two subtypes of a single type as follows:

(27) a. def-rel-cl  ⇒

\[ SS \mid LOC \left[ CAT \left[ HEAD \left[ c \mid MOD \mid LOC \mid CAT \left[ NP[DEF +] \right] \right] \right] \right] \]

b. indef-rel-cl  ⇒

\[ SS \mid LOC \left[ CAT \left[ HEAD \left[ c \mid MOD \mid LOC \mid CAT \left[ NP[DEF -] \right] \right] \right] \right] \]

The problem with this approach is that there is nothing here to ensure that definite relatives are headed by ʔallaði and not other complementizers such as ʔan or ʔanna.
The properties that the two complementizers share can be associated with the type *rel-complementizer* and the properties which are limited to *ʔalladš* or its phonologically empty counterpart can be associated with the two subtypes.

The type *rel-complementizer* will have the following description:

(29)

\[
\begin{align*}
\text{rel-complementizer} & \quad \text{def-rel-complementizer} \\
\text{indef-rel-complementizer} & \\
\end{align*}
\]

This is essentially the description that we originally proposed for *ʔalladš* minus the stipulation that the modified NP is [DEF +]. It will ensure that relative clauses modify an NP and contain a gap or a resumptive clitic with the same index, thus ensuring that the NP and the gap or resumptive clitic agree in number and gender. It will also ensure that the CONTENT value of a relative clause is a restricted index, with the restrictions stemming from its complement and the NP it modifies. Among other things, this means that there is no need for the special *head-relative-phrase* type.

The two subtypes will have the following descriptions:

(30) a.

\[
\begin{align*}
[\text{def - rel - complementizer} & ] \\
[SS | LOCAL | CAT | HEAD | MOD[DEF+] & ] \\
\end{align*}
\]
b.   def-rel-complementizer w i l l  h a v e  v a r i o u s  d i f f e r e n t  f o r m s  d e p e n d i n g  o n  t h e  value of the features NUMBER, GENDER and CASE in the modified NP.  

\[
\text{def-rel-complementizer} \rightarrow \text{HEAD}\rightarrow \text{MOD[DEF -]}
\]

\[
\begin{array}{c}
\text{indef-rel-complementizer} \\
\text{PHON <->}
\end{array}
\]

\[
\text{SS|LOCAL|CAT|HEAD|MOD[DEF -]}
\]

\[\text{def-rel-complementizer} \text{ will have various different forms depending on the value of the features NUMBER, GENDER and CASE in the modified NP.}
\]

\[\text{indef-rel-complementizer} \text{ is phonologically empty.}
\]

With these descriptions, definite relatives will have the structure in (20), and indefinite relatives will have a similar structure, as in (31).

\[
(31)
\]

\[
\begin{array}{c}
\text{NP} \\
\text{[1]NP[2]} \\
\text{[DEF -]}
\end{array}
\]

\[
\begin{array}{c}
\text{CP} \\
\text{MOD[1]} \\
\text{SLASH{}}
\end{array}
\]

\[
\begin{array}{c}
\text{C} \\
\text{MOD[1]} \\
\text{SLASH{NP[2]}}
\end{array}
\]

\[
\begin{array}{c}
\text{S} \\
\text{SLASH{NP[2]}}
\end{array}
\]

\[
\begin{array}{c}
\text{V} \\
\text{NP} \\
\text{NP}
\end{array}
\]

walad-un e qaabala e l-malik-a

Thus, definite and indefinite relatives have essentially the same structure and differ only in the phonology of their heads. In this analysis, verbs in indefinite relatives have the same category and content as elsewhere, and \text{$\text{ʔalla}$} has a description which makes it unsurprising that it is restricted to relative clauses. The analysis also entails a simpler system of phrase types. Not only does it not need the \text{head-relative-phrase} type, there is also no need for the types of \text{def-rel-cl} and \text{indef-rel-cl}. The distinctive properties of the two types of relative clause stem from the properties of their heads.

What about the type \text{rel-cl}? It is fairly easy to dispense with this type as well. The constraint in (15) ensures that a relative clause modifies an NP with the same index as the NP value of SLASH, but this is also ensured by (29). The only nonredundant feature of (15) is the stipulation that relative clauses are [SLASH {)]. There is an obvious alternative way to ensure this. In most head complement structures, if the complement has a non-empty SLASH value, the SLASH Amalgamation Principle requires the head to have the same value. However, there are situations in which the head should not have
this value. For example, in (32) the infinitival complement of easy is \( [\text{SLASH} \{\text{NP}\}] \) but easy must be \( [\text{SLASH} \{\}] \).

(32) Kim is easy to impress.

If the SLASH Amalgamation Principle is a default constraint, this can be ensured by a stipulating that easy takes a complement which is \( [\text{SLASH} \{\text{NP}\}] \) but is itself \( [\text{SLASH} \{\}] \). We can take the same approach here. That is, we can replace (29) by (33).

(33)

With this revision there is no need for a type rel-cl subject to some constraint. Relative clauses are just head-complement structures, whose properties stem from the lexical items that head them, in the case of indefinite relatives a phonologically empty one.

Essentially this analysis makes relative clauses rather like attributive adjectives, which, as we noted in Section 2, they resemble in being sensitive to the definiteness of the modified NP. No special types are required for attributive adjectives. Similarly no special types are required for relative clauses.

On this analysis, relative clauses are not a subtype of clause. This might seem like a problematic conclusion. However, we do not think that it is. It does not follow from the fact that relative clauses are called clauses that they are a subtype of clause. It is traditional to refer to the bracketed expressions in the following as adverbial clauses:
(34) a. Kim left [before Lee arrived].
b. Lee arrived [after Kim left].

However, it is widely accepted that such expressions are in fact PPs. (See e.g. Huddleston and Pullum (2002: 599–601).) On this view they are not a subtype of clause.

It seems, then, that there are good reasons for preferring an analysis of Arabic relatives with a phonologically empty head and no special phrase types to an analysis with no phonologically empty heads and a complex system of phrase types. Thus, whatever may be the case with other languages, with Arabic it looks as though the kind of approach developed in Pollard and Sag (1994) is preferable to the approach developed in Sag (1997).

5 Conclusions

Relative clauses have a basically clausal internal structure but are modifiers of nominal constituents rather like adjectives. Pollard and Sag (1994: Chapter 5) employ a set of phonologically empty heads to capture this dual nature. The heads take a clausal complement and head a phrase which is a nominal modifier. Sag (1997) rejects this approach and develops a complex system of phrase types, in which the dual nature of relatives is mainly the product of a special head-rel-phrase type.

In the case of Arabic definite relatives it seems natural to attribute the dual nature to the complementizer ʔallaðî given that it seems to be confined to relative clauses. But then a problem arises with indefinite clauses. If they are analyzed in much the same way as Sag analyzes English bare relatives, then either definite and indefinite relatives have quite different analyses or the natural analysis of ʔallaðî must be abandoned, in which case its restricted distribution is quite surprising.

We have argued that the best account of the Arabic data involves the assumption that indefinite relatives are headed by a phonologically empty counterpart of ʔallaðî. On this analysis, definite and indefinite relatives have essentially the same analysis. Both are head-complement structures, whose properties stem from their head. The properties of definite relatives stem from ʔallaðî and it is unsurprising that it is confined to relative clauses. Verbs have the same category and content in indefinite relatives as elsewhere. The analysis also has no need for special phrase types, no rel-cl, def-rel-cl and indef-rel-cl and no head-rel-ph. At least in the case of Arabic, then, the approach to relative clauses developed in Pollard and Sag (1994) seems preferable to that developed in Sag (1997).
REFERENCES


