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Head-internal relatives in Japanese/Korean

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The internally headed relatives (IHRs) of Japanese and Korean belong to the general class of 'definite' relative constructions, whose CP was characterized in Grosu & Landman (1998) as denoting singleton predicates. Kim (2007), building on Hoshi (1995) and Shimoyama (1999, 2001), defines this CP as denoting a proposition that contains the antecedent of an E-type anaphor. It is argued in this paper that this approach, which undesirably enriches the class of definite relatives, also necessitates the imposition of highly unnatural restrictions on anaphora, which blur the distinction between pragmatics and grammar. The paper proposes an alternative analysis that avoids the conceptual and empirical objections faced by E-type approaches in general and by Kim's in particular, and assigns singleton status to Japanese/Korean IHRs in a straightforward and natural way.

1. Introductory remarks

The literature of the last thirty years or so has recognized the existence of a semantic type of relative clause construction that is distinct from the traditionally known restrictive and appositive types, and is characterized by necessarily definite (or, in certain cases, universal) force, to the exclusion of existential force. In this paper, I will refer to them as 'definite relative constructions', universal force not being relevant to what follows.

Definite relatives occur in a variety of syntactic garbs, in particular, as free relatives (Jacobson 1995), correlatives (Srivastav 1991), externally-headed relatives (Carlson 1977), and internally-headed relatives (Hoshi 1985); see Grosu (2002) for a survey of the relevant literature up to the time of its publication. Grosu & Landman (1998) proposed the interesting hypothesis that these syntactically diverse constructions can be brought under a unifying theoretical umbrella by analyzing the relative CP as a **singleton predicate**. On this view, definite relatives are closer to restrictives than to appositives, since just like the former, they denote predicates, rather than propositions, as the latter do. The feature which distinguishes definite from restrictive relative clauses is, according to Grosu & Landman, that the former, but not the latter, undergo a **semantic** (i.e., grammatical, not pragmatic!) process of maximalization, which maps a (possibly non-singleton) predicate to the singleton containing its maximal member, if there is one, and is undefined otherwise. This process was viewed by Grosu & Landman (op. cit., section 2.5) as being responsible for the necessarily definite semantics of these constructions[1].

[1] Grosu & Landman's proposal was further spelled out in Grosu (2002, example (10b)), where it was suggested that the effect arises out of a pragmatic conflict between the uniqueness of the singleton's membership and the implicature of possible non-uniqueness associated with existential quantification.

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In contrast to this unifying approach, the I(nternally) H(eaded) R(elative)s of Japanese and Korean, which have the kind of definite semantics alluded to in the first paragraph of this section[2], have been analyzed by a number of semanticists in a way that brings them closer to appositives than to restrictives, in spite of the important fact that they do not have the independent illocutionary status of the former. In particular, Hoshi (1995), Shimoyama (1999, 2001), and Kim (2007) have proposed analyses which view the relative clauses of Japanese/Korean IHRs as propositions in which some nominal expression (the I(nternal) H(ead)) is the antecedent of a (CP-external) E-type anaphor, the interpretation of the latter providing the content of the IHR.
The E-type approach to IHRs might have some initial plausibility, in view of the fact that the relative CP has the superficial appearance of a complete clause, in contrast to the relative CP of semantically definite E(xternally)HRs, which typically exhibit a 'gap.' This can be appreciated by comparing the Japanese IHR in (1) (=(9) in Shimoyama 1999) with the definite EHRs in (2a-b), which are, respectively, a free relative (adapted from Jacobson 1988), and an individual-denoting degree relative (adapted from Carlson 1977 and Grosu & Landman 1998.

(1) Taro-wa [$_{DP}$[$_{CP}$Yoko-ga reezooko-ni **kukkii-o** **hotondo** irete-
Taro-Top Yoko-Nom refrigerator-Loc **cookie-acc** **most** put-
oita]-no]-o paatii-ni motte itta.
perf-no-acc party-to brought
'Yoko put most cookies in the refrigerator and Taro brought {them, *some} to the party.'

(2) a. I ate [what Mary gave me __] (i.e., everything she gave me, not just some of it).
b. I took away [*?(the) three books that there were __ on the desk]

At the same time, this approach is arguably non-optimal on a number of conceptual and empirical grounds. First, it enriches the universal typology of definite relative constructions in that the relative CP sometimes denotes a proposition (in IHRs), and sometimes a predicate (in EHRs, for which an E-type approach has little initial plausibility). Second, E-type anaphora all by itself does not yield an empirically adequate characterization of Japanese/Korean IHRs, because the choice of possible IHs is considerably more restricted than the choice of possible E-type antecedents in discourse, as Shimoyama (1999, 2001) and Kim (2007) prominently note. It thus becomes necessary to recognize two types of E-type anaphora, one subject only to pragmatic constraints, and one also subject to grammatical constraints, a view that blurs the distinction between grammar and pragmatics. Third, it is not clear (at least, it

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Arguably, this effect may be viewed as a special case of a more general principle, dubbed 'Maximize Presupposition' in Heim (1991), where it was invoked to account for the preferred status of the definite article in superlatives. This principle says, essentially, that when a presupposition of uniqueness exists, this state of affairs should be 'acknowledged' by the determiner, so that the definite article, which has a stronger presupposition than the indefinite article, is preferred to the latter.

[2] As has been repeatedly noted in the literature, the grammars of Japanese and Korean share numerous features, and this seems to be especially true of their IHRs, as also pointed out by Kim (2007, footnote 4). The only possible difference of which I am aware is that Shimoyama (1999, 2001) states that proper names may not be IHs, while Kim gives numerous examples with proper names as IHs, which she rates as fully acceptable.
For completeness, I note that I have not checked the existence of data like (9)-(10) and (12) in Korean, but given the striking similarities between the two languages, I will assume, until proof to the contrary, that comparable Korean data have the same acceptability values.

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has not been shown) that E-type anaphora can be saddled with grammatical restrictions in a natural and economical way. While Shimoyama (op. cit.) was somewhat vague concerning the characterization of the restrictions operative in IHRs, Kim (op. cit.) offered a precise characterization which, as will be seen below, faces considerable difficulties when attempting to cope with the entire range of Japanese/Korean IHRs (in particular, with data that these authors did not consider).
The principle goal of this paper is to propose an analysis of Japanese/Korean IHRs that avoids the objections noted in the preceding paragraph. The analysis will offer a natural characterization of the constraints operative in these IHRs, which will also enable the relative CP to emerge with singleton predicate status, thereby avoiding an undesirable enrichment of Universal Grammar and the blurring of the distinction between pragmatics and grammar.
The remainder of the paper is organized as follows: Section 2 summarizes the ways in which Shimoyama and Kim propose to deal with the restrictions that distinguish IHRs from discourse anaphora, section 3 critically evaluates their proposals, focusing primarily on Kim's, section 4 presents my alternative analysis of definite IHRs, and section 5 summarizes the results of the paper.

2. Shimoyama and Kim on the choice of possible IHs

In contrast to Hoshi, who proposed to assume that the choice of IHs is restricted in the same way as the choice of antecedents in E-type anaphora, Shimoyama and Kim noted a number of additional constraints that are operative in IHRs only. I list below the principal constraints noted by these writers, with illustrations based on English data, because reproducing examples in the original languages would exceed existing space limitations.
[A] In discourse, the antecedent of the E-type anaphor need not be in the sentence immediately preceding it, while in IHRs, the antecedent can only be internal to the relative clause (see example (45) in Shimoyama 1999, and example (14) in Kim 2007). To briefly illustrate, consider (3), where *them* can refer to both the books and the newspapers that Mary brought home. Comparable Japanese and Korean discourses behave likewise, but if the second sentence is turned into an IHR embedded into the third (as object of *put*), the IHR can only denote the newspapers.

(3) Mary bought and brought home **three books**. She also bought and brought home **some newspapers**. Bill put *them* on the bookshelf.

[B] In a discourse like (4), the interpretation of *they* can be accommodated to denote students who did not attend the party. But if the first sentence is embedded to the second as an IHR, the IHR can have only the absurd reading that the students who attended the party were simultaneously at home (see examples (52)-(53) in Shimoyama 2001, Chapter 3).

(4) Only **a few graduate students** came to the party on Saturday. In fact, *they* were writing term papers at home.

[C] In (5), either the sushi or the wife may be anaphorically resumed, but if the first sentence is embedded into the second, the resulting IHR can only denote the sushi (see examples (64)-(65) in Shimoyama 2001, Chapter 3, and (15)-(16) in Kim 2007). Shimoyama suggests on this basis that the IH must bear a thematic role assigned by

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the predicate of the relative clause, that is to say, a role **in the event described by the relative clause** (note that if the IHR purports to refer to the wife, the thematic role of the IH is assigned by the noun *sushi,* and is thus not a role in the event described by the relative). – Observe that this suggestion also takes care of facts noted in [B], since the students who stayed at home do not play a thematic role in the event described by the relative.

(5) Every man served **his wife's sushi** to the guest, and the guest praised *{it, her}* immediately after that.

[D] Kim argues that Shimoyama's suggestion just noted is still not restrictive enough, because not only the lexical verb, but also its aspect may play a role in determining which nominals may serve as IH. Thus, consider (6), which is adapted from Kim's Japanese examples (25)-(26).

(6) a. Bill was having a wedding ceremony with **a pretty woman**, and the priest tried to talk *her* into joining the local women's club.
b. Bill had gotten married to (in Japanese: 'with') a pretty woman, and the priest tried to talk her into joining the local women's club.

Both subcases of (6) are acceptable, and so are their exact Japanese/Korean counterparts. However, if the first conjunct is embedded to the second as an IHR, only (6a) yields an acceptable result. In Japanese, the boldfaced expression plays a Concomitant thematic role in both cases, so that Shimoyama's suggestion does not predict the contrast between the IHR counterparts of (6a) and (6b).
Kim proposes to trace this contrast to the fact that the aspect is progressive in (6a)[3] and perfect in (6b). Minimally modifying proposals made in Parsons (1990), she proposes to make the following assumptions: (a) a progressive sentence describes an *in-progress state,* which includes all the thematic roles pertaining to the event described by the lexical verb; (b) a perfect sentence with an atelic verb describes a *resultant state*, which includes only the Agent argument of the event described by the verb; (c) a perfect sentence with a telic verb describes a *target state*, which includes only the incremental Theme argument of the event described by the verb; (d) a perfective sentence does not describe a state. Kim's modification of Shimoyama's suggestion is that the IH must play a thematic role in the **state** described by the lexical verb and its aspect, which, as can be gathered from (a)-(d), does not always include all the participants in the event described by the verb. Given this proposal, the deviance of the IHR version of (6b) is attributable to the fact that the intended IH does not play a role in the relevant state, which includes the Agent, but not the Concomitant role.
[E] As noted by Kuroda (1976-7), Japanese IHRs are subject to certain restrictions that are not found in minimally different EHRs, and certainly not in discourses, and comparable restrictions exist in Korean. Kuroda stated these restrictions in the form of

[3] Akira Watanabe informs me that Kim's example (26) does not have progressive aspect within the IHR, but is rather in a non-past form which receives a future construal analogous to that of English constructions like *John {leaves, is leaving} tomorrow morning,* which imply that the future event has already been decided on at the moment of speech. This in turn implies that Kim's aspectual generalizations listed below in the text will need to be augmented with something like 'a sentence that describes a planned future event also describes a(n earlier) state of having planned that event.' Be this as it may, to the extent that Kim's examples (25) and (26) contrast in acceptability in the way she claims they do, her claim that Shimoyama's characterization is insufficiently restrictive stands.

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a rather vague 'Relevancy Condition', which Kim (2008) showed can be fruitfully decomposed into pragmatic and semantic components. The semantic component of this condition can be appreciated in relation to (7). If the first conjunct is embedded to the second as an IHR, only (7a) yields an acceptable result (in contrast, if the first conjunct is turned into an EHR, the result is acceptable for (7b) as well; cf. *Anthony had arrested yesterday the thief who is running away right now*).

(7) a. A thief was running away, and Anthony caught him.
b. A thief is running away right now, and Anthony arrested him yesterday.

Kim proposes to deal with such effects in the way informally described in (8a) ((8b) is meant to deal with the effects noted in [D]). The contrast between the IHR counterparts of (7a) and (7b) follows from the fact that in the former, the thief is in an in-progress state of running away when he gets caught, while in the latter, the thief was not in such a state when he got arrested.

(8) a. The relative clause must describe a temporary state that temporally intersects with the eventuality described by the matrix clause.
b. The intended IH must bear a thematic role in that state.

Kim's formalization of (8) is outlined in her section 4. I confine myself to outlining the gist of her proposals here. Syntactically, she assumes an overt representation and a distinct LF representation, which are illustrated in her examples (38) and (39) respectively (not reproduced for lack of space). Basically, the relative clause consists of a VP that includes the lexical verb and its thematic arguments, and which serves as the complement of an Aspect head. Crucially, the AspP serves as complement to the relative Complementizer, there being no T(ense)P, above AspP; this proposal is made in order to capture (8a) in the following way: the Tense of the matrix is viewed as unselectively binding temporal variables in the denotation of both matrix and embedded AspPs. In the overt representation, the relative CP is the complement of a noun, realized as *kes* in Korean and *no* in Japanese. The complex NP formed by these two constituents is complement to a null Det bearing the feature [+definite]. Kim views the N and the Det as jointly defining an E-type anaphor, which needs to find an antecedent within N's sister in a way consistent with (8b). Kim assigns to the relative CP and its N sister types that do not allow them to combine, and proposes to solve the conflict by covertly raising CP, adjoining it to the matrix AspP, and leaving behind a trace that gets interpreted as a state variable. At the stage where the matrix Asp needs to combine with the relative CP, there is a new mismatch in types, which is resolved by abstracting over the state variable. The combination of the relative CP with the abstract assigns to the state variable abstracted over the content of the state described by the AspP of the relative clause. In this way, (8b) is satisfied.

3. Critical evaluation of Shimoyama's and Kim's proposals

While the facts considered by Kim and the observations she makes are highly interesting, they are also insufficient in an important way. Thus, all the examples she considers (and those discussed by Shimoyama as well) exhibit **monoclausal** IHRs. As a result, the IH is always a member of the **highest clause** within the relative. Correlatively, the choice of an IH is always made within the state defined by the relative. However, it is by no means necessary for the IH to be a member of the

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highest clause within the relative. The following examples, due to Akira Watanabe, illustrate this point (comparable data are also signaled in Hoshi 1995 and Kuroda 1999); (9a) and (10) are, respectively, (39a) and (41) in Watanabe (2003), and (9b) was kindly provided by Akira Watatanabe (p.c.).

(9) a. Mary-ga [John-ga [zibun-no gakusei-ga **yuuyouna kasetu-o**
Mary-Nom John-Nom self-Gen student-Nom important hypothesis-Acc
teianshita to] jimanshite-ita-no]-no kekkan-o shitekishita.
proposed Czer boasted-had- no-Gen defect-Acc pointed-out
*'[John had boasted [that his student proposed **an important hypothesis**]] and Mary pointed out a defect in **it**.'*

b. [[[Zibun-no gakusei-ga juuyouna kasetsu-o teianshita to] John-ga
self-gen student-nom important hypothesis-acc proposed C John-nom
jimanshite-iru to] minna-ga itte-ita-no]-no kekkan-o Mary-ga shitekishita.
boasting-is C everyone-nom say-had-C-gen defect-acc Mary-nom pointed out
'[Everyone said [that John had boasted [that his student proposed **an important hypothesis**]]] and Mary pointed out a defect in **it**.'

(10) a. [[Mary-ga itsu **ronbun**-o shiageru-ka] John-ga Tom-ni tazunete-
Mary-nom when paper-acc finish-Q John-nom Tom-dat asked-
ita]-no-ga shuppan-sareta.
had-no-nom publish-pass
'[[John had asked Tom [when Mary would finish **a (certain) paper**]] and that paper was published.

b. [[Mary-ga itsu **ronbun**-o shiageru-ka] John-ga Tom-ni tazunete-
Mary-nom when paper-acc finish-Q John-nom Tom-dat asked-
ita]-no-no shuppan-ga okureta.
had-no-gen publication-nom was delayed
'[[John had asked Tom [when Mary would finish **a (certain) paper**]] and the publication of that paper was delayed.

Such data do not fall under (8b), since the IHs do not play a thematic role in the eventuality described by the relative, and cannot be analyzed by the entry Kim assigns to *kes/no*, which identifies the anaphor with an antecedent playing a role **in the state denoted by *kes/no*'s sister**, as can be gathered from (11).

(11) $[[kes/no_{R,P}]]^g = \lambda s_s.\lambda x_e[g(R)(x)(s)\ \&\ g(P)(x)$
where *s,x,R,P* are variables over states, individuals, thematic roles and properties respectively, and g is an assignment function.

To allow for data like (9)-(10), (11) would minimally need to be modified by **relaxing the relation R**, which in its present form, denotes (i) a thematic role (ii) pertaining to the state denoted by *kes/no's* sister. The relaxation may apply to either (i) or (ii). If applied to (ii), the assignment function g could, e.g., apply to a free variable over states, subject to the requirement that this state is contained within the state denoted by the state variable abstracted over; the thematic role R would then be selected in relation to this 'smaller' state. A perhaps more elegant alternative, suggested to me by Fred Landman (p.c.), would be to relax (i), by allowing R to denote more complex (and arguably less natural) relations. For example, if the relative clause has the essential form *[John told me that Fred wrote **a book**]*, one can imagine a relation that

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holds between an event of saying (or the resulting state) and a book, if the theme of the eventuality is a proposition claiming that there is some event of writing with that book as Theme.

Either extension seriously detracts from the elegance and naturalness of (11) in its present form, the former extension in fact being blatantly non-compositional. At least as seriously, both extensions need to be made sensitive to constraints that typically apply to unbounded syntactic dependencies, as Watanabe (1992, 2003) shows. Thus, while the IH may be contained within a declarative or interrogative complement clause (as can be seen in (9) and (10) respectively; see Watanabe 2003 for a proposed explanation of the fact that IHRs are not sensitive to the wh-island constraint), it may not be contained within a relative clause properly included within the IHR, as shown in (12) (kindly provided by Akira Watanabe, p.c.). In other words, the antecedent-anaphor dependency is sensitive to Ross' Complex NP Constraint, a property not found with the discourse variety of E-type anaphora (cf. (12) with (13)). Now, island constraints are typically operative in the syntax, and allowing them to constrain the operation of assignment functions or the characterization of complex semantic relations[4] is an undesirable step, which suggests that an analysis based on such extensions is barking up the wrong tree.

(12) *Mary-ga [John-ga [atarashii kasetu-o
Mary-Nom John-Nom new hypothesis-Acc
teianshita gakusei-o] homete-ita-no]-no kekkan-o shitekishita.
proposed student-acc praise-had- no-Gen defect-Acc pointed-out
'[John praised [the student who proposed a new hypothesis]] and Mary pointed out a defect in it.'

(13) a. Jon-wa [**hitsuji-o san-tou** katteiru *hitujikai-o*] shitteiru.
John-top sheep-acc 3-cl keep shepherd-acc know
Sore-ni-wa meshitsukai-ga esa-o yatteiru.
that-dat-top servant-nom food-acc give
"John knows a shepherd who owns three sheep. The servant feeds them."

b. Jon-wa hitsuji-o san-tou katteiru.
John-top sheep-acc 3-cl-KA keep
[**Sore-ni** yesa-o yaru *meshitsukai-wa*] kyoo-wa yasumi-da.
that-dat food-acc give servant-top today-top holiday-cop
"John has three sheep. The servant who feeds them is on holiday today."

Finally, it seems highly unlikely that (8a) can be maintained in its present form. Rather, I would guess that the state which needs to temporally intersect with the eventuality described by the matrix needs to be the one in which the IH plays a role. I have not been able to check this hypothesis with native consultants, but my educated guess is that the contrast between the IHR counterparts of (6a) and (6b) persists if the first conjunct is placed in the context *everybody knows that* __. I thus wish to suggest that the informal characterization in (8) needs to be changed to something like (14) (modifications are indicated in boldface).

[4] Observe that given a relative clause like *[John introduced me to the person who had written **a book**]*, it is in principle possible to define a relation between an event of introducing someone and a book, if the goal of the event is an entity characterized by an event of writing whose Theme is the book. Accordingly, the CNPC needs to be 'externally' imposed on the relation.

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(14) a. **Some clause within** the relative clause must describe a temporary state that temporally intersects with the eventuality described by the matrix clause **in worlds in which both are defined**.
b. The intended IH must bear a thematic role in that state, and the dependency it forms with the relative-external anaphor must respect the CNPC.

What has been said in this section points to the conclusion that Kim's analysis of IHRs, which relies on a formal variety of the E-type anaphora, is fraught with serious empirical problems, in addition to the conceptual objections noted in section 1. In section 4, an alternative analysis will be presented which avoids these conceptual and empirical objections.

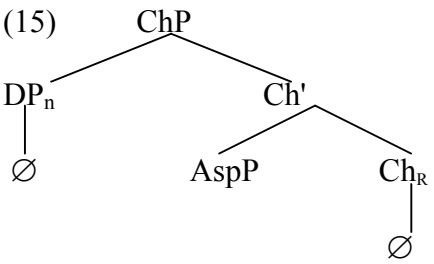
4. An alternative analysis of Japanese/Korean IHRs

The twin goals of the analysis to be developed in this section are (i) to retain the valuable aspects of Kim's analysis, in particular, the points brought out in section 2, while (ii) avoiding the conceptual and empirical problems that it faces, in particular, those noted in sections 1 and 3. To this end, I propose to assume that definite IHRs in general are characterized by a functional category which sits inside the relative clause and freely picks out a thematic role pertaining to the eventuality described by its complement (in this respect, it is similar *kes/no* as analyzed by Kim). I will call this category Ch(P). The complement of Ch is some AspP within the relative. The relative CP does not raise, and is interpreted *in situ*.

The entity defined by the selected thematic role gets equated with a free individual variable in [Spec, Ch], which undergoes abstraction at the relative CP level, thereby enabling CP to emerge with predicate status. The variable in [Spec, Ch] constitutes the denotation of the trace of a 'null operator' that is base generated in this position and undergoes cyclic A-bar raising to the relative's Spec, thereby accounting for the arbitrary depth of the IH and for its sensitivity to the CNPC[5].

The internal structure of ChP is schematically shown in (15), and the translations assigned to its Head and Spec are shown in (16).

(15)



[5] In order to capture (14a), I assume, in the spirit of Kim's treatment of (8a), that there is no TP immediately above ChP. This result can be ensured by stipulating that in the languages where definite IHRs exhibit the temporal intersection restriction, T may not select ChP as complement (it is not known at the moment whether this restriction is present in all the languages that have definite IHRs, or only in some of them).

Kim does not make explicit how the absence of TP is to be ensured, but she would also need some kind of stipulation. As far as I can see, the logical type she assigns to the relative complementizer enables it to combine with an AspP only, but since the same complementizer also occurs in EHRs, where she assumes that a TP exists, she would presumably need to have two distinct entries for this complementizer. The problem is exacerbated by data like (9)-(10), which suggest that double entries might be needed for all complementizers.

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(16) a. $[[Ch_R]]^g = \lambda S \lambda s.S(s) \wedge (R)(s) = (g(R))(s)$
b. $[[DP_n]_R] = \lambda S \lambda s.S(s) \wedge R(s)=x_n$

In (16), the subscript 'R' may be viewed as a semantic feature interpreted as a free variable over thematic roles. (16a) says that the value of that feature is freely chosen by the assignment function g from among the roles pertaining to the eventuality denoted by AspP. Being a feature, we may assume Spec-Head agreement, so that after application of Ch to AspP, we may assume that the value of R is already specified in the translation of the specifier. To illustrate how things work, consider the derivation of the IHR in (1), whose syntactic structure is more explicitly represented in (17).

(17) Taro-wa [$_{DP}$[$_{NP}$[$_{CP}$[$_{ChP}$∅[$_{Ch'}$[$_{AspP}$[$_{VP}$Yoko-ga reezooko-ni **kukkii-o hotondo** irete]
Taro-Top Yoko-Nom fridge-Loc **cookie-Acc most** put
-oita]∅]] ∅]-no]-∅]–o paatii-ni motte itta.
-perf-Ch-Czer-no-Det-Acc party-to brought
'Yoko put most cookies in the fridge and Taro brought them to the party.'

The compositional interpretation of (17) starts with the VP, which receives the interpretation in (18) (for ease of analysis, *most cookies* has been assigned the semantics of 'more than half of the (contextually assumed) cookies'); e is a variable over events, and **t** is the sum operator.

(18) $\lambda e.PUT(e) \wedge Ag(e)=Yoko \wedge *COOKIE (Th(e)) \wedge IN(e)=FRIDGE \wedge |Th(e)| > |t(*COOKIE)¡Th(e)|$

The next step concerns the level of AspP. The aspect is perfect with a target state, because the lexical verb is telic, and the translation assigned by Kim to this type of aspect is shown in (19). (19) applied to (18) yields (20) as the denotation of AspP.

(19) $[[Prf\text{-}Targ]] = \lambda Q_{<e,t>} \lambda s \lambda t_i \exists e[Q(e) \& Target(s,e) \& t_i \subseteq \tau(s)]$
where e, s, t_i , are variables over events, states and times respectively.
(20) $(\lambda Q_{<e,t>} \lambda s \lambda t_i \exists e[Q(e) \& Target(s,e) \& t_i \subseteq \tau(s)])$
$(\lambda e.PUT(e) \wedge Ag(e)=Yoko \wedge *COOKIE(Th(e)) \wedge IN(e)=FRIDGE \wedge |Th(e)| > |t(*COOKIE)¡Th(e)|) =$
$\lambda s \lambda t_i \exists e[PUT(e) \wedge Ag(e)=Yoko \wedge *COOKIE(Th(e)) \wedge IN(e)=FRIDGE \wedge |Th(e)| > |t(*COOKIE)¡Th(e)| \& Target(s, e) \& t_i \subseteq \tau(s)]$

The next level is that of Ch', where Ch applies to its complement, i.e., AspP. The only value for R that will yield an acceptable outcome is Theme (see Kim's (48a), which ensures this result by means of an axiom), so let us assume this is the value chosen by g. Application of (16a) to (20), followed by application of (16b) to the outcome and by Existential Closure over the event variable yields (21) (the time variable will ultimately get bound by the matrix T).

(21) $\exists s \lambda t_i \exists e[PUT(e) \wedge Ag(e)=Yoko \wedge *COOKIE(Th(e)) \wedge IN(e)=FRIDGE \wedge |Th(e)| > |t(*COOKIE)¡Th(e)| \& Target(s, e) \& t_i \subseteq \tau(s)] \wedge Th(s)=x_n$

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Unlike Kim, who assigned a fairly complex logical type to the relative complementizer, we may assume that this complementizer is, just as in English-type EHRs, simply the identity function on propositions.

The next step is abstraction over the free individual variable, which yields a set of sums of cookies corresponding to the states induced by the various events of Yoko putting a majority of the contextually assumed cookies in the fridge. For concreteness, let us assume there were eight cookies in all, and that Yoko put seven of them in the fridge. The abstract at issue will include all the sums of five, six, and seven cookies in the fridge. At this point, we may assume that Maximalization applies to the abstract, yielding a singleton whose member is the sum of seven cookies in the fridge. This operation is precisely what Grosu & Landman (1998) proposed happens in definite relatives in general, and thus brings definite IHRs under the general theoretical umbrella of definite relative constructions[6].

The ensuing steps are straightforward. The items *kes/no* are simply interpreted as maximally underspecified nominal predicates, i.e., the identity function on individuals, so that the denotation of the complex NP is identical to that of the relative CP. Finally, given the singleton status of NP, a definite Determiner is straightforwardly coerced (see footnote 1). Note that Kim needed to stipulate the definiteness of the null external determiner, because bare nominal expressions can in principle be either definite or indefinite in Japanese and Korean, and IHRs are also 'bare' in this sense.

5. Summary and conclusions

This paper has pursued two twin goals. On the one hand, it has evaluated a number of analytical approaches to the semantically definite IHRs of Japanese/Korean IHRs, all of which crucially relied on the E-type strategy combined with a variety of additional constraints. The focus has primarily been on Kim (2007), which constitutes the most recent and ambitious attempt to deal with the different behaviour of the E-type strategy in IHRs and in discourses. It was shown that E-type approaches in general, and Kim's analysis in particular, are fraught with serious descriptive difficulties when confronted with the full range of relevant data, in addition to being conceptually non-optimal.

The second goal of the paper has been to propose an alternative analysis that avoids the objections which confront those earlier analyses, and adequately deals with both the descriptive and conceptual issues. The picture of Japanese/Korean IHRs that emerges from the proposed analysis is arguably that of a 'hybrid' construction, which has a pragmatic ingredient 'at the bottom' (insofar as the choice of an IH within the complement of Ch is free), and is governed by grammatical principles above that level (semantic equation, null operator A-bar movement, abstraction, and maximalization). Crucially, the relative clause is characterized as a **singleton predicate**, and thus fits effortlessly within the general class of definite relative constructions.

[6] Grosu & Landman (1998) and Grosu (2002) observe that the maximalization operation within definite relatives appears to be a primitive property in certain cases (in particular, in free relatives and correlatives), and an arguably derivable one in other cases. In (2b), for example, Grosu & Landman derive the individual denotation of the construction on the basis of the cardinalities of the various sums of entities defined by existential quantification over the individual variable, and the only way of unambiguously deriving an individual from a number is arguably by ensuring that a single <number, individual> ordered pair is under consideration. In the case of Japanese/Korean IHRs, a justification might be sought in the fact that without maximality, some of the information obtained by quantification of the IH would fail to be preserved in the meaning of the IHR.

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