

The Japanese Internally Headed Relative Clause is *not* an E-type pronoun*

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1 The proposal in short

- Internally headed relative clauses (IHRCs) in Japanese (and Korean) do *not* involve E-type anaphora (i.e. they are not *definite* descriptions with descriptive content recovered from the context), contra previous analyses (Hoshi 1995; Shimoyama 1999; Matsuda 2002; Kim 2005).
- Following Shimoyama (1999), we assume that the semantic interpretation of the IHRC crucially involves anaphora, but the E-type mechanism that she posits not only is unnecessary but makes incorrect predictions.
- The full range of interpretations available for the IHRC (definite, indefinite, covariational) corresponds to the range of interpretations available for Japanese ‘null pronouns’ (Tomioka 2003) rather than what is predicted by the E-type analyses.
- Pragmatics plays a central role in restricting the range of possible interpretations in specific examples of the IHRC, giving the apparent impression that the IHRC uniquely denotes a definite expression for some sentences.

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2 What are IHRCs?

(1) 洋子は [太郎が皿の上にケーキを置いた] のを食べた。

Yooko wa [Taroo ga sara no ue ni keeki o oi-ta] no
Yoko TOP Taro NOM dish GEN top DAT cake ACC put-PAST NMLZ
o tabe-ta.
ACC eat-PAST

‘Yoko ate the cake that Taro put on the table.’

A nominalized clause without a gap:

- occupies an argument position in the matrix clause (direct object position marked by the accusative marker in the case of (1))
- behaves as if it were denoting some entity described by that clause.

Typically some argument in the embedded clause can be identifiable as the ‘internal head’—*keeki* ‘cake’ in (1).¹

Challenge to compositional semantics:

- Why can a clause occupy an argument position (where a nominal category is expected)?
- What is the mechanism by means of which the ‘internal head’ is retrieved from the meaning of the embedded clause?

3 What are E-type pronouns?

- Evans (1980) noted certain uses of pronouns that cannot be treated as either referential expressions with linguistic antecedents or bound variables and called them ‘E-type pronouns’.
- Most authors in the previous literature followed Cooper (1979) in formalizing the notion of the E-type pronoun as (i) a definite description (ii) whose descriptive content (property that determines its identity) is recovered from the context.
- We use the term ‘E-type’ pronoun/anaphora for the kind of treatments of pronouns/anaphora that satisfy both of the properties (i) and (ii).

¹But this is not always the case, as we will see below.

- Cooper's (1979) formal treatment of the E-type pronoun:^{2,3}
 $\lambda K \exists x [\forall y [[\forall P](y) \equiv y = x] \wedge K(x)]$
- Phenomena that have typically been accounted for in terms of E-type pronouns:
 - discourse anaphora without linguistic antecedents (Evans 1980)
 - (2) John owns many sheep. Harry vaccinates *them* every spring.
them = the sheep that John owns
 - * *Them* is somewhat related to the quantifier *many sheep* but is not bound by it.
 - * Since the E-type pronoun is treated as a definite description, the maximality effect is entailed. That is, the pronoun refers to the maximum sum of the entities that satisfy the relevant property.
 - donkey pronouns
 Many authors (most notably Cooper (1979)) have suggested a possibility that donkey pronouns can also be treated as E-type pronouns.
 - (3) Every farmer who owns a donkey beats *it*.
it: 'the donkey that x owns'
 (where the *x* is bound by the quantifier)
 - * This analysis solves the scope paradox of donkey sentences (i.e. the problem that you cannot account for the covariational readings of donkey sentences if donkey sentences are treated as either bound variables or referential expressions).
 - * But this approach does not fully account for the whole range of data of donkey sentences in English. In particular, cases in which maximality is not observed are problematic.⁴

4 E-type analyses of the Japanese IHRC

4.1 Motivations for the E-type analysis

- Previous approaches in terms of LF raising were shown to have insurmountable obstacles (see Shimoyama (1999) for details).
- Alleged parallels between the IHRC and phenomena typically treated in terms of E-type pronouns.
 - maximality (Hoshi 1995)

- (4) a. ジョンは [メアリーが三個のリンゴをむいてくれた] のを食べた。

John wa [Mary ga san-ko no ringo o mui-te
 John TOP Mary NOM three-CL GEN apple ACC peel
 kure-ta] no o tabe-ta.
 BENEf-PAST NMLZ ACC eat-PAST

'John ate the three apples that Mary peeled (for him).'

- b. 太郎は [洋子が冷蔵庫にクッキーをほとんど入れておいた] のをパーティーに持っていった。

Taroo wa [Yooko ga reizooko ni kukkii o
 Taro TOP Yoko NOM refrigerator DAT cookies ACC
 hotondo ire-te oi-ta] no o paatii ni mot-te
 most put PERF-PAST NMLZ ACC party DAT bring
 it-ta.
 go-PAST

'Taro brought to the party the cookies that Yoko put in the refrigerator (which was most of the cookies).'

- covariation (Shimoyama 1999)

- (5) どの学生_iも、[(そいつ_iが) 今学期ペーパーを三本書いた] のを今朝提出した。

Dono gakusei_i mo [{soitu_i ga / pro_i} kongakki peepaa
 every student that guy NOM this semester paper
 o san-bon kai-ta] no o kesa
 ACC three-CL write-PAST NMLZ ACC this morning
 teisyutu-si-ta.
 turn.in-do-PAST

'This morning every student turned in the three papers that (s)he had written this semester.'

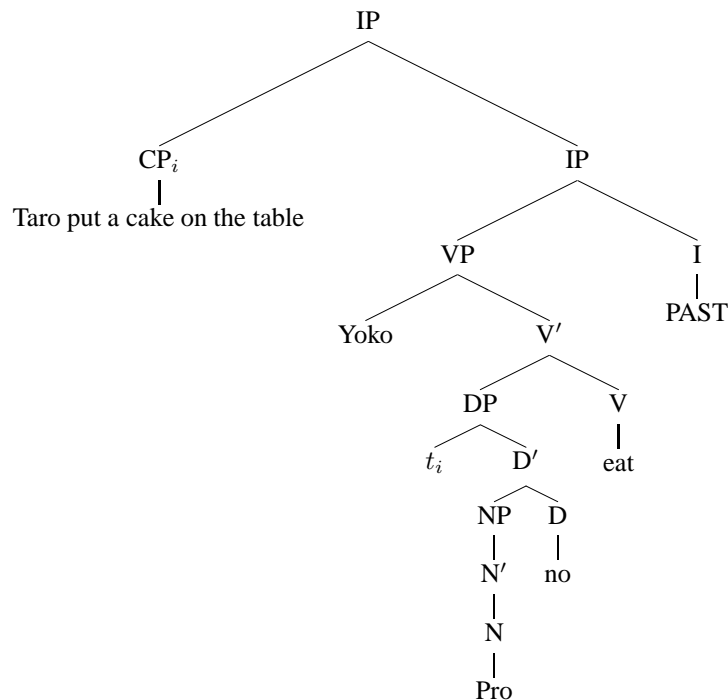
²Cooper (1979) actually does not use the term 'E-type pronoun' to describe his formal analysis of pronouns, but it can be regarded as a formalization of Evans' idea and for that reason it is classified as an E-type analysis in the subsequent literature.

³Cooper (1979) adopts a Russellian account of the uniqueness of definite descriptions. Some of the subsequent authors adopt a presuppositional account instead, but they agree in assuming that the uniqueness should be encoded in the semantics of the E-type pronoun.

⁴Heim (1990) and Elbourne (2005) pursue a direction of elaborating the E-type approach to donkey sentences in English in terms of situation semantics.

4.2 Shimoyama's (1999) analysis of the IHRC

(6)



- IHRCs are treated in Shimoyama's (1999) analysis effectively as a conjunctions of two clauses where

- the first conjunct is the IHRC and
- the second conjunct is the matrix clause with an E-type pronoun sitting in the position where the IHRC appears in the surface structure.

Thus, (6) gets an interpretation that can be paraphrased as ‘Taro put a cake on the table and Hanako ate *the cake that Taro put on the table*’.

- Shimoyama's (1999) analysis is an E-type analysis because:
 - The value of the property variable of the E-type pronoun is recovered in reference to the context.

$\llbracket D' \rrbracket = \iota x P(x)$ where P is the relevant property

When the actual value of the property variable P gets instantiated, this term becomes equivalent to the semantic translation of the definite description ‘the cake that Taro put on the table’.

- Maximality is encoded as a semantic property of the nominalizer.

- Covariational readings of IHRCs are accounted for by QR'ing the quantifier to a position higher than where the IHRC adjoins to the matrix clause at LF.

5 Data that pose problems for the E-type analysis of the IHRC

5.1 Examples of non-maximal interpretation with an IHRC

- (7) a. 太郎は [ポケットの中に百円玉が入っていた] のをメーターに入れた。
 Taroo wa [poketto no naka ni hyakuen-dama ga hait-te
 Taro TOP pocket GEN inside DAT 100yen-coin NOM in
 i-ta] no o meetaa ni ire-ta.
 be-PAST NMLZ ACC meter DAT put-PAST
 ‘Taro put into the meter a 100 yen coin he had in his pocket.’
- b. 太郎は [缶の中に飴が入っていた] のを取り出してなめた。
 Taroo wa [kan no naka ni ame ga hait-te i-ta] no
 T TOP can GEN inside DAT candy NOM in be-PAST NMLZ
 o toridasi-te name-ta.
 ACC pick.out eat-PAST
 ‘Taro picked out and ate one/some of the candies in the can.’
- c. どの学生も [花子がビーフシチューを作った] のを喜んで食べた。
 Dono gakusei mo [Hanako ga biifu sityuu o tukut-ta] no o
 every student Hanako NOM beef stew ACC make NMLZ ACC
 yorokon-de tabe-ta.
 gladly eat-PAST
 ‘Every student enjoyed eating the beef stew that Hanako made.’

5.2 Contextual near-minimal pair suggesting that maximality is a pragmatic, not semantic, effect

- (8) a. (At the security check of an airport:)
 どの乗客も [ポケットにコインが入っていた] のを取り出してトレイ
 に載せた。
 Dono zyookyaku mo [pro_i poketto ni koin ga hait-te i-ta]
 every passenger pocket DAT coin NOM in be-PAST
 no o toridasi-te torei ni nose-ta.
 NMLZ ACC pick.up tray DAT put-PAST
 ‘Every passenger picked up the coins that she/he had in her/his pocket and put them on the tray.’
- b. (At the ticket gate at a train station:)
 どの乗客も [財布に回数券が入っていた] のを取り出して改札に入
 れた。

Dono zyookyaku_i mo [pro_i saifu ni kaisuken ga hait-te
 every passenger wallet DAT coupon.ticket NOM in
 i-ta] no o toridasi-te kaisatu ni ire-ta.
 be-PAST NMLZ ACC pick.up ticket.checker DAT put-PAST
 ‘Every passenger picked up a coupon ticket that she/he had in her/his
 wallet and put it in the ticket checker.’

5.3 Consequences for E-type approaches

- The only remaining similarity between the IHRC and the E-type pronoun is covariation, which is not specific to E-type anaphora.
- To revise the E-type account would complicate the picture significantly.⁵
- Thus, the IHRC does not look like any of these ‘standard’ anaphora categories, which begs the question: what are they similar to?

6 Parallels between IHRCs and ‘null pronouns’

6.1 Maximality or the lack thereof

Null pronouns exhibit maximal and nonmaximal readings depending on the context (Tomioka 2003). The examples in (9) parallel the IHRC examples in (8), where (9a) is the definite reading and (9b) is the indefinite reading.

⁵Further complications abound such as these examples that pose problems for the uniqueness presupposition of the E-type analysis. It is not possible to identify in (i), the unique set of six out of the seven bottles, and (ii) the unique brother helped by the eldest.

- (i) 今日は酒屋の店員さんが気前がよくて、[ビールを六本買った] のにおまけを一本つけてくれた。

Kyoo wa sakaya no ten'in-san ga kimaie ga yoku-te, [biiru o rop-pon kat-ta]
 today TOP liqueur.shop GEN cashier NOM generous beer ACC 6-CL buy-PAST
 no ni omake o ip-pon take-te kure-ta.
 NMLZ DAT freebie ACC one-CL put BENEF-PAST

‘The cashier at the liqueur shop was generous today and he gave me one bottle of beer in addition to the six bottles of beer that I bought.’

- (ii) 二人の弟を持つ兄は決まって、[片方がもう一方と喧嘩している] のを家にかくまうものだ。

Futari no ototoo o motu ani wa kimatte, [katahoo ga moo-ippoo
 two GEN younger.brother ACC have elder.brother TOP always either NOM the.other
 to kenkasi-te iru] no o ie ni kakumau mono da.
 with fight PROG NMLZ ACC house at harbor

‘Any boy who has two younger brothers always protects one of them when one is fighting with the other.’

- (9) a. 太郎は東京でブッシュ大統領を見た。花子は大阪で見た。
 Taroo wa Tookyoo de Bussyu daitooryoo o mi-ta. Hanako
 Taro TOP Tokyo LOC Bush president ACC see-PAST Hanako
 wa Oosaka de *pro* mi-ta.
 TOP Osaka LOC see-PAST
 ‘Taro saw president Bush in Tokyo. Hanako saw *pro* (= him) in Osaka.’
 b. 太郎は東京で UFO を見た。花子は大阪で見た。
 Taroo wa Tookyoo de UFO o mi-ta. Hanako wa Oosaka
 Taro TOP Tokyo LOC UFO ACC see-PAST Hanako TOP Osaka
 de *pro* mi-ta.
 LOC see-PAST
 ‘Taro saw a UFO in Tokyo. Hanako saw *pro* (= one) in Osaka.’

The null pronoun examples in (10) are analogous to those for which the maximality effect is observed with the IHRC (numeral expressions or quantifiers with existential presuppositions in the antecedent clause):

- (10) a. お母さんがりんごを三個むいてくれたので、真理はおやつに食べた。
 #後から理香が来て、残りを食べた。
 Okaasan ga ringo o san-ko mui-te kure-ta no de, Mari wa
 mother NOM apple ACC three-CL peel BENEF because Mari TOP
pro oyatu ni tabe-ta. # Ato kara Rika ga ki-te, nokori o
 snack for eat-PAST afterwards Rika NOM come rest ACC
 tabe-ta.
 eat-PAST
 ‘Since her mother peeled three apples for Mari, she ate *pro* (= them) for a snack. #Rika came afterwards and ate the rest.’
 b. 真理が、焼いたクッキーを全部冷蔵庫に入れておいたら、健が勝手にパーティーに持って行ってしまった。
 #残りは理香がおやつに食べた。
 Mari ga yai-ta kukkii o zenbu reizooko ni ire-te
 Mari NOM bake-PAST cookies ACC all refrigerator DAT put
 oi-ta-ra, Ken ga katte ni *pro* paatii ni mot-te
 PERF-PAST-COND Ken NOM without permission party DAT bring
 it-te simat-ta. # Nokori wa Rika ga oyatu ni tabe-ta.
 go EMPH-PAST rest TOP Rika NOM snack for eat-PAST
 ‘When Mari put most of the cookies in the refrigerator, Ken brought *pro*
 (= them) to the party. # Rika ate the rest for a snack.’

- Indefinite readings do not seem to be available for sentences like (10a,b), just as in the IHRC examples.

6.2 Formal link or the lack thereof

Hoshi (1995) noted that example (11b), in which no overt ‘antecedent’ is found in the embedded clause, is less acceptable than (11a) in which there is one.

IHRC cases

- (11) a. 山田さんは[お隣の息子さん若いお嫁さんもらった]のを町内の婦人会に勧誘しようとした。
 Yamada-san wa [otonari no musuko-san ga wakai
 Ms. Yamada TOP next-door GEN son NOM young
 oyome-san o morat-ta] no o tyoonai no
 bride ACC get-PAST NMLZ ACC neighborhood GEN
 huzin-kai ni kanyuu-si-yoo to si-ta.
 women’s club DAT talk.into.joining-tried
 ‘Ms. Yamada tried to talk into joining the neighborhood women’s club the young bride of her neighbor’s son.’
- b. # 山田さんは[お隣の息さんが結婚した]のを町内の婦人会に勧誘しようとした。
 Yamada-san wa [otonari no musuko-san ga
 Ms. Yamada TOP next-door GEN son NOM
 kekkon-si-ta] no o tyoonai no huzin-kai ni
 get.married-PAST NMLZ ACC neighborhood GEN women’s club DAT
 kanyuu-si-yoo to si-ta.
 talk.into.joining-tried
 intended: ‘Ms. Yamada tried to talk into joining the neighborhood women’s club the young bride of her neighbor’s son.’

As he points out, this is essentially the same problem as the formal link problem Heim (1990) describes for pronouns. For Japanese (null and overt) pronouns, we find the same kind of contrast:

Null pronoun cases

- (12) a. お隣の息さんが若いお嫁さんもらったので、山田さんは町内の婦人会に勧誘しようとした。
 Otonari no musuko-san ga wakai oyome-san o morat-ta
 next-door GEN son NOM young bride ACC get-PAST
 no de, Yamada-san wa *pro* tyoonai no huzin-kai ni
 since Ms. Yamada TOP neighborhood GEN women’s club DAT
 kanyuu-si-yoo to si-ta.
 talk.into.joining-tried

‘Since the neighbor’s son married a young bride, Ms. Yamada tried to talk *pro* (= her) into joining the neighborhood women’s club.’

- b. # お隣の息さんが結婚したので、山田さんは町内の婦人会に勧誘しようとした。
 Otonari no musuko-san ga kekkon-si-ta no de
 next-door GEN son NOM get.married-PAST since
 Yamada-san wa *pro* tyoonai no huzin-kai ni
 Ms. Yamada TOP neighborhood GEN women’s club DAT
 kanyuu-si-yoo to si-ta.
 talk.into.joining-tried
 intended: ‘Since the neighbor’s son got married, Ms. Yamada tried to talk *pro* (= his wife) into joining the neighborhood women’s club.’

However, there are examples like those in (13) (for both IHRCs and pronouns) which are counterexamples to a simple generalization that says that the ‘antecedent’ has to be linguistically expressed.⁶

- (13) a. *IHRC*:
 [原料の配合を大豆七割、小麦二割、フスマ一割にする]のが昔の味に一番近い。
 [Genryoo no haigoo o daizu nana-wari, komugi ni-wari,
 ingredients GEN ratio ACC soy.bean 70% wheat 20%
 fusuma iti-wari ni suru] no ga mukasi no azi ni itiban
 bran 10% DAT make NMLZ NOM old GEN taste DAT most
 tikai.
 close
 ‘Making the ratio of the ingredients 70% soy bean, 20% wheat and 10% bran will make soy sauce (?) that tastes most like traditional ones.’ (Nikkei Shinbun, slightly simplified, 1993?)
- b. *null pronoun*:
 結婚している人は、家で夕飯の支度をして待っているから、あまり遅くまで残業できない。
 Kekkonsi-te iru hito wa, [*pro* ie de yuuhan no sitaku
 married be person TOP home LOC dinner GEN preparation
 o si-te mat-te iru] kara, amari osoku made zangyoo
 ACC do wait PROG because very late till overtime.work

⁶There is a possibility that (13a) is not a case of the IHRC construction, given that the nominalizer *no* can be replaced by an ordinary noun such as *resipi* ‘recipe’ in this sentence (such is not the case with other genuine cases of the IHRC). (Thanks to Shuichi Yatabe for pointing this out to us). Even if this specific example is inadequate for that reason, there are cases of the IHRC that do not conform to the formal link constraint for which such a replacement is not possible, like the examples that are discussed in Kikuta (2002) (Examples in (11) on p. 206–7).

deki-nai.

can.do-NEG

‘Those who are married can’t stay too late working overtime since (their wives) are preparing dinner and waiting for them.’

6.3 Implications

We have seen the following similarities between the null pronoun and the IHRC.

- They both exhibit maximal and nonmaximal interpretations.
- In both cases, these interpretations depend on context.
- They both receive exclusively maximal interpretations with numerical classifiers and quantifiers with existential presuppositions.
- They both generally adhere to the formal link constraint, but similar violations can be found for both.

Resulting hypothesis:

- The anaphoric relation involved in the interpretation of IHRCs is the same as the one involved in the interpretation of ‘null pronouns’.

7 Current direction of investigation

7.1 Nature of the IHRC construction

We speculate that IHRCs get the interpretations that they get for the following reasons:

- In an IHRC sentence, a clause is sitting in the position of a nominal argument.
- This means, under the null hypothesis, that there is no way in which the IHRC can make any direct contribution to the truth conditions of the sentence (since the types of what’s there and what the verb is looking for don’t match).
- Thus, the meaning of the IHRC can only be integrated with the meaning of the whole sentence as some kind of background information (be it a presupposition or conventional implicature-like thing) by means of which it *indirectly* affects the interpretation of the sentence.
- As a consequence, the truth conditions of the sentence are computed *as if no lexical element were occupying that argument position*.

- This is effectively the same as when a null pronoun ‘occupies’ the relevant argument position (since in the case of null pronouns, there really is nothing in the argument position).

Under this approach, if we adopt, for example, variable-free semantics, it would be possible to account for covariational readings by something independently motivated rather than by a mechanism specifically designed to explain them as the E-type approaches have needed to stipulate.

7.2 Differences between sequences of sentences with a null pronoun and the IHRC

7.2.1 DISCOURSE CONDITIONS

(14) ジョンは、[メアリーがりんごをむいた]のを食べた。

John wa [Mary ga ringo o mui-ta] no o tabe-ta.
John TOP Mary NOM apple ACC peel-PAST NMLZ ACC eat-PAST

‘John ate the apples that Mary peeled.’

(15) (?)メアリーがりんごをむいたので、ジョンが食べた。

(?)Mary ga ringo o mui-ta no de, John wa *pro* tabe-ta.
Mary NOM apple ACC peel-PAST since John TOP eat-PAST

‘Mary peeled apples. John ate *pro* (= them).’

(16) #メアリーがりんごをむいた。ジョンが食べた。

#Mary ga ringo o mui-ta. John wa *pro* tabe-ta.
Mary NOM apple ACC peel-PAST John TOP eat-PAST

‘Mary peeled apples. John ate *pro* (= them).’

7.2.2 TEMPORAL CONDITIONS

(17) a. 太郎は[うさぎがレースを完走した]のにタオルをやった。

Taroo wa [usagi ga reesu o kansoosi-ta] no ni
Taro TOP rabbit NOM race ACC finish.running-PAST NMLZ DAT
taoru o yat-ta.
towel ACC give-PAST

‘Taro gave a towel to the rabbit who finished the race.’

b. うさぎがレースを完走したので、太郎はタオルをやった。

usagi ga reesu o kansoosi-ta no de, Taroo wa *pro*
rabbit NOM race ACC finish.running-PAST since Taro TOP
taoru o yat-ta.
towel ACC give-PAST

‘Since the rabbit finished the race, Taro gave a towel to *pro* (= it).’

c. うさぎがレースを完走した。太郎はそいつにタオルをやった。

Usagi ga reesu o kansoosi-ta. Taroo wa soitu ni
rabbit NOM race ACC finish.running-PAST Taro TOP it DAT
taoru o yat-ta.
towel ACC give-PAST

‘The rabbit finished the race. Taro gave a towel to it.’

In both of these cases, it seems that the closeness of one clause to another effects interpretation. There are a wide range of subtle facts that we hope to investigate next to yield a combined semantic and pragmatic story that explains all of the data.

8 Conclusion

Shimoyama (1999) (as the exemplar of the E-type approach) must stipulate the presence of an E-type pronoun to account for covariational readings of the IHRC but does not explain:

- why an anaphoric process is involved (and specifically why E-type anaphora)
- why a null element is sitting with or in place of the IHRC and
- why that null element should take part in the calculation of the truth conditional content.

In contrast, the approach we are advocating/developing would not posit any null elements since both null pronouns and IHRCs are merely unsaturated argument positions, and:

- their parallelism would be predicted
- it would be clearer why anaphora was involved in both cases (when an argument is ‘missing’, it is natural to try to retrieve something from previous discourse) and
- it has the potential to explain a range of puzzles related to the IHRC that an E-type approach has no straightforward treatment of.

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