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

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In Japanese Internally Headed Relative Clauses (IHRCs) such as (1), it is puzzling that the whole clause serves as the syntactic argument of the matrix verb while the verb's semantic argument is a nominal. The compositional semantics must therefore explain how a sentential meaning (presumably of type $\langle s,t\rangle$) is converted to a nominal one (presumably of type *e* or $\langle\langle e,t\rangle,t\rangle$). It has also been noted that IHRCs receive a semantically 'maximal' interpretation. For example, (1) is judged to be false if John eats some rather than all of the apples that Mary peels. Previous accounts of the semantics of the IHRC (Hoshi, 1995; Shimoyama, 1999; Matsuda, 2002; Kim, 2005) have appealed to the mechanism of E-type anaphora (thereby claiming that the IHRC is a definite description) because these clauses seemingly receive a maximal/definite reading and there are no clear accessible antecedents for them. In the face of new data, however, we argue that IHRCs are not disguised definite descriptions, but rather can be unified with a treatment of other nominals in Japanese (bare nominals, null pronouns) in being underspecified for definiteness, which, following Tomioka (2003), is determined contextually.

Several significant objections to the E-type/IHRC parallel are discussed in the paper, the most important of which is the anti-definite claim. Previously overlooked are examples that can be interpreted non-maximally, such as (2). Here, in a model where John has several 100-yen coins in his pocket, it suffices for him to put a single coin in the meter, but if the IHRC denoted a definite maximal individual, on the basis of E-type behavior, we would expect this sentence to mean that John put in the maximum number of 100-yen coins contained in his pocket. It is well known that non-maximal readings also plague E-type analyses of English donkey sentences. This similarity between the English donkey sentences and the Japanese IHRC should not be taken to lend further support for an E-type treatment of the IHRC, however. One crucial difference between them is that you do not have the effect of binding out of the IHRC, i.e. the scope paradox inherent to English donkey examples (which the application of the E-type analysis was originally proposed to overcome) is missing. This means that the primary advantage of the E-type technology is absent in its application to the Japanese data, while its primary weakness (the prediction that non-maximal readings should be impossible) remains. In view of the significant discrepancy between the predictions of the E-type pronoun model on the one hand and the IHRC facts on the other, it seems that the semantics of the IHRC needs to be reconsidered from the beginning.

In this talk, we supply a formal proof of both maximal/definite and non-maximal/indefinite semantic interpretations for the IHRC that builds on previous work but does not rely on the IHRCs' E-type status. Our approach to this problem makes use of the relation between a proposition (of type $\langle s,t\rangle$) and a (possibly plural) individual such that the latter is *salient* in the eventuality described by the former, which is encoded in the lexical meaning of *no* given in (i). We further adopt the type-shifting operators independently motivated for the semantics of bare nouns and null pronouns as in (ii) and (iii) (Tomioka, 2003), thereby freeing our analysis from construction-specific machinery such as the definite-marking of previous analyses. *Iota* is an operation that takes a property and returns the unique individual that has that property; existential insertion takes a property and returns a generalized quantifier with existential force in which that property serves the role of the restrictor of that quantifier (a straightforward adoption of Montague's treatment).

(i) *no*: $\lambda p.\lambda x.Sal(\hat{}p)(x);\ \langle t,\langle e,t\rangle\rangle$ (where ***Sal(ient)*** is of type $\langle\langle s,t\rangle,\langle e,t\rangle\rangle$)

(ii) *iota* (for definite reading): $P \rightarrow \iota x.P(x);\ \langle e,t\rangle \rightarrow e$

(iii) existential insertion (for indefinite reading): $P \rightarrow \lambda Q.\exists x[P(x) \wedge Q(x)];\ \langle e,t\rangle \rightarrow \langle\langle e,t\rangle,t\rangle$

An example derivation for the hitherto unaccounted for indefinite reading in (3) is given in (4). This treatment of the IHRC is similar to the original account advocated by Hoshi, but *crucially* does not share its pitfalls; we have seen that it can account for non-maximal readings. We will also explore where the maximality for many examples comes from, the ways in which context affects it and how it relates to the *Sal* function. These conclusions are significant not just for the particular description of the IHRC in Japanese, but also for the division of labor between formal semantics on the one hand and the pragmatics of discourse on the other.

Examples:

(1) 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.'

(2) John wa [[*pro*$_i$ poketto] no naka ni hyakuen-dama ga hait-te i-ta] no o
John TOP pocket GEN inside DAT 100yen-coin NOM in be-PAST NMLZ ACC
meetaa ni ire-ta.
meter DAT put-PAST
'John put into the meter a 100 yen coin he had in his pocket.'

(3) Ken wa [kan no naka ni ame ga hait-te i-ta] no o toridasi-te name-ta.
Ken TOP can GEN inside DAT candy NOM in be-PAST NMLZ ACC pick.out eat-PAST
'Ken picked out and ate one/some candy that was in the can.'

(4) a. *kan no naka ni ame ga hait-te i-ta* $\Rightarrow \exists x[candy(x) \wedge be\_in\_the\_can(x)]$

b. *kan no naka ni ame ga hait-te i-ta no* $\Rightarrow \lambda y.Sal(\hat{}\exists x[candy(x) \wedge be\_in\_the\_can(x)])(y)$

c. *kan no naka ni ame ga hait-te i-ta no*
$\Rightarrow \lambda Q.\exists y[Sal(\hat{}\exists x[candy(x) \wedge be\_in\_the\_can(x)])(y) \wedge Q(y)]$ (by existential insertion)

d. *Ken wa kan no naka ni ame ga hait-te i-ta no o toridasi-te*
$\Rightarrow \exists y[Sal(\hat{}\exists x[candy(x) \wedge be\_in\_the\_can(x)])(y) \wedge pick\_up(y)(k)]$

e. Paraphrased meaning: 'Ken picked up something that bears the relevant property in the eventuality of there being candies in the can.' Relevant property: $\lambda x.candy(x) \wedge be\_in\_the\_can(x)$

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