Japanese Contentful Internally Headed Relative Clauses under *believe* and *know*

Introduction: Japanese has two complementizers, *to* and *no*, as illustrated in (1). An interesting ambiguity arises when the attitude verb *shinjir* 'believe' takes a *no*-clause that embeds a *to*-clause, as in (2). In the first reading, the proposition *Hanako had three ex-bfs* is the content of the embedded speech act by Hanako, rather than the matrix belief by Taro. This reading straightforwardly follows from the general idea that both *to* and *no* are complementizers (see Shimamura 2018, Bogal-Allbritten et al. 2024 for recent analyses). More intriguing is the second reading, where the proposition is also attributed to Taro's belief. Notably, this reading is absent when the matrix verb is *shir* 'know,' as in (3).

(1) Mary$_i$-wa [[jibun$_i$-ga ninshin-shi-teiru] **to / no**-o] Taro-ni itta.
Mary-TOP self-NOM pregnancy-do-STATE TO / NO-ACC Taro-DAT said
'Mary$_i$ told Taro [that she$_i$ was pregnant].'

(2) Taro-wa [$_{no}$P Hanako-ga [$_{to}$P motokare-wa san-nin-da **to**] itta **no**]-o **shinji-teiru**.
Taro-TOP Hanako-NOM ex.boyfriend-TOP three-CL-be TO said NO-ACC believe-STATE
a. (?) 'Taro believes [that Hanako$_i$ said that she$_i$ had three ex-boyfriends].'
b. 'Taro believes [that Hanako$_i$ had three ex-boyfriends]$_j$, which$_j$ she$_i$ said.'

(3) Taro-wa [$_{no}$P Hanako-ga [$_{to}$P motokare-wa san-nin-da **to**] itta **no**]-o **shit-teiru**.
Taro-TOP Hanako-NOM ex.boyfriend-TOP three-CL-be TO said NO-ACC know-STATE
a. 'Taro knows [that Hanako$_i$ said that she$_i$ had three ex-bfs].'
b. * 'Taro knows [that Hanako$_i$ had three ex-bfs]$_j$, which$_j$ she$_i$ said.'

This paper aims to account for the second reading (2b) by arguing that the *no*P in this parse is not a complement clause but an internally headed relative clause (IHRC), parallel to the one in (4). I propose that IHRCs can abstract over a clausal theme argument and introduce a content individual. Its content proposition of type $\langle st \rangle$ can saturate the internal argument of *shinjir*, but not that of *shir* because it has to select for an interrogative complement of type $\langle st, t \rangle$, as proposed by Uegaki (2016) and Djärv (2023).

(4) Taro-wa [$_{\text{IHRC}}$ [Hanako-ga **orange**-o tsukue-ni oi-ta] **no**]-o katteni tabeta.
Taro-TOP Hanako-NOM orange-ACC table-LOC put NO-ACC without.asking ate
'Taro ate the [$_{\text{NP}}$ **orange** [that Hanako put on the table]] without asking.'

Propositional IHRCs: I adopt two core assumptions about IHRCs, which are widely accepted in the literature after the E-type anaphora analysis by Hoshi (1995) and Shimoyama (1999). (i) IHRCs can form an et-type predicate P by abstracting over a theme argument within the clause. (ii) The definiteness operator applies to P and yields a definite description. Since my proposal builds only on these shared assumptions, I set aside technical implementation differing among the subsequent analyses (e.g., Kim 2009, Grosu 2010). Given the two ideas, the IHRC in (4) abstracts over the theme *orange*, creating the predicate in (5a). Applying the definiteness operator yields the definite individual in (5b), which saturates the internal argument of *tabeta* 'ate.'

(5) a. λx_e. Hanako put x on the table $\wedge$ x is an orange
b. $[\![\text{IHRC in (4)}]\!] = \iota x[$ Hanako put x on the table $\wedge$ x is an orange$]$

I propose extending this analysis to account for (2b): the predicate in (6a) is derived by abstracting over the *to*-headed propositional theme of *itta* 'said.' This abstraction is motivated by the view that complement clauses can denote predicates of type $\langle e, st \rangle$ via a function $\mathscr{F}cont$, defined in (6b) after Kratzer (2013). After the definiteness operator applies, the entire IHRC *no*P is interpreted as in (6c), a definite description akin to 'the thing Hanako said and whose content is that she had three ex-bfs.'

(6) a. λx_e.Hanako said x in $w \wedge \mathscr{F}cont(x)(w) = \lambda w'$. Hanako had three ex-bfs in w'
b. $\mathscr{F}cont(x)(w) = \{w' : w'$ is compatible with the intentional cotent determined by x in $w\}$
c. $[\![$*no*P in (2)$]\!]^w = \iota x[$H said x in $w \wedge \mathscr{F}cont(x)(w) = \lambda w'$. H had three ex-bfs in $w']$

The lexical entry of *shinjir* 'believe' is offered in (7a), which takes a proposition and an attitude holder, returning truth just in case the proposition holds true in all of the subject's doxastic worlds. For *shinjir* to be composed with *no*P, I assume a type shifter CONT, simplified from Uegaki (2016), as in (7b). This type shifter takes a content individual and returns its propositional content. (7c) illustrates that application of CONT to the IHRC 'extracts' the proposition with the uniqueness presupposition due to the ι operator preserved. Then, *shinjir* takes this proposition and the matrix subject *Taro*, yielding (8).

(7) a. $[\![\textit{shinjir}]\!]^w = \lambda p_{st}.\lambda x_e.\forall w' \in \text{DOX}_x^w[p(w') = 1]$

b. $[\![\textsc{Cont}]\!]^w(x) = \lambda w'.w' \in \mathscr{F}cont(x)(w)$ (adapted from Uegaki 2016)

c. $[\![\textsc{Cont}\ [\textit{no}\text{P}]]\!]^w = \lambda w'.$Hanako had three ex-bfs in w',
defined if $\exists!x$[H said x in $w \wedge \mathscr{F}cont(x)(w) = \lambda w''$. H had three ex-bfs in w'']

(8) $[\![$Taro *shinijir* (7c)$]\!] = 1$ *iff* $\forall w' \in \text{DOX}^w_{\textbf{Taro}}$[Hanako had three ex-bfs in w'],
defined if $\exists!x$[H said x in $w \wedge \mathscr{F}cont(x)(w) = \lambda w''$. H had three ex-bfs in w'']

Knowing IHRCs: In contrast, I argue in line with Uegaki (2016) and Djärv (2023) that *shir* 'know' cannot compose with an st-type proposition. Thus, a type-mismatch arises when *shir* takes (7c), ruling out (3b). Yet, it remains necessary to account for (3a), where *shir* complementizes a *no*-clause. Following Uegaki (2016), I assume that such a clause is lifted into a question of type $\langle st, t\rangle$ via the type shifter Id, as in (9). The rogative verb *shir* can compose with this singleton-set question and yield the epistemic interpretation, as in (10).

(9) a. $[\![\textsc{Id}]\!]^w = \lambda p_{st}.\lambda q_{st}.q = p$ (Uegaki 2016)

b. $[\![\textsc{Id}\ \textit{no}\text{P}_{\textsc{comp}}]\!]^w = \lambda q_{st}.q = \lambda w'.$H said that she had three ex-bfs in w'

(10) a. $[\![\textit{shir}]\!]^w = \lambda Q_{\langle st,t\rangle}.\lambda x_e.\exists p \in Q[p(w) = 1 \wedge \forall w' \in \text{DOX}_x^w[p(w') = 1]]$

b. $[\![(3)]\!]^w = \exists p \in \{\lambda w'.$H said that she had three ex-bfs in $w'\}[\forall w' \in \text{EPIS}^w_{\textbf{Taro}}[p(w') = 1]]$

As noted by Uegaki (2016), deriving a question from a content nominal is independently ruled out, e.g., because the nesting of Cont and Id violates economy constraints. Supporting this, (11) shows that a content question embedded in an IHRC cannot be relativized to a matrix responsive verb.

(11) Keesatsu-wa [$_{no\text{P}}$ kisha-ga [$_{ka\text{P}}$ Taro-ga yoogisha **ka**] tazuneta no]-o akiraka.ni shita.
police-top reporter-nom T.-nom suspect **Q** asked no-acc clear did

a. 'The police revealed that a reporter had asked whether Taro was a suspect.' (COMP)

b. * 'The police revealed whether Taro was a suspect, which a reporter had asked.' (IHRC)

***de re/de dicto*:** Our IHRC analysis predicts that, under the reading (2b), the matrix subject need not believe that the embedded subject made the reported speech act. This prediction is borne out, as below.

(12) **Mary-no mama-mo** [$_{no\text{P}}$ Taro-ga Mary-ni [$_{to\text{P}}$ BMW-o katta to] itta no]-o shinji-teiru.
M.-gen mom-too T.-nom M.-dat B.-acc bought to said no-acc believe-state
'Mary's mom also believes that Taro$_i$ bought a BMW, which he$_i$ told Mary.' (IHRC)

(13) $[\![(12)]\!]^w = \forall w' \in \text{DOX}^w_{\textbf{MM}}$.Taro bought a BMW in w',
defined if $\exists!x$[T said x to M in $w \wedge \mathscr{F}cont(x)(w) = \lambda w''$.T bought a BMW in w'']

Some informants report that (12) allows both *de re* and *de dicto* interpretations, mirroring the ambiguity found in the English sentence *Mary's mom believes Taro$_i$'s claim that he$_i$ bought a BMW.* Under the *de re* reading, Mary's mom believes that Taro bought a BMW but not that he made a claim about it. Under the *de dicto* reading, Mary's mom also believes that he made such a claim. I will discuss this ambiguity in (12) in relation to how presuppositions projects when they are introduced by nominal complements of attitude predicates.

IHRCable Content: I conclude this talk by outlining a possible future direction for analyzing the derivation of content IHRCs. In (14), the theme argument of the stance verb *hitei-suru* 'deny' cannot be the internal head of the content IHRC. This presumably suggests that content IHRCs yield *event nominals* (Grimshaw 1990, Moulton 2014), such as 'Taro's denial of the rumor' in (14). If the content function that maps an event to a content proposition (Kratzer 2006, Hacquard 2006, Elliott 2020) is involved, the function returns the proposition compatible with the expressed stance. In (14), such a content should be compatible with Taro's denial and thus correspond to the negation of the rumor's content. Then, this content can be 'extracted' by Cont, deriving the attested reading in the way proposed above.

(14) Hanako-wa [$_{\text{IHRC}}$ Taro-ga [$_{\text{theme}}$ uwasa-o] **hitei-shita** no]-o shinji-teiru
Hanko-top T-nom rumor-acc denial-did no-acc believe-state

a. * Hanako believes the rumor which Taro denied.

b. Hanako believes Taro's denial of the rumor.

$\rightsquigarrow$ Hanako believes the negation of the rumor's content

Selected References: **Shimoyama (1999)** JEALS(8) 147–182; **Kratzer (2006)** Talk@the Hebrew University of Jerusalem; **Uegaki (2016)** JoS(33) 623–660; **Elliott (2020)** UCL dissertation