都留文科大学大学院紀要　第26集（2022年３月）
THE TSURU UNIVERSITY GRADUATE SCHOOL REVIEW,
No.26（March, 2022）

Numeral Expressions in Head Internal Relative Clauses

Takashi IMAI

Abstract

There are two kinds of relative clauses, i.e. Head External and Head Internal. The pivotal relative clauses are Head External in the languages of the world, while quite many languages utilize Head Internal Relative Clauses in which Head is inside the TP of the relative clause. In order to explain Head Internal relative Clauses, we can utilize a theory of Grafts advocated by Riemsdijk, and show that Graft can well explain numeral expressions in Head Internal Relative Clauses.

Keywords: graft, head internal relative clauses, merge, numeral expressions

0. Introduction

The relative clause strategy consists of two formations, i.e. Head External Relative Clauses and Head Internal Relative Clauses in world languages. The pivotal Relative Clause is a Head External Relative Clause, while quite many languages utilize Head Internal Relative Clauses. Head Internal Relative Clauses are observed in a wide variety of languages across different language families: Old and Modern Japanese, Korean, Tongus languages in the Atlantic family such as Udihe, Tibeto-Burman languages such as Meithei, Tenyidie, Austronesian languages such as Riau Indonesian, Tukang Besi, etc. (Hiraiwa 2003). See Alddridge (2002, 2003), Grosu and Landman (1998), Grosu and Hoshi (2019), Jo (2002), Keenan and Comrie (1977), Kim (2005). For Head Internal Relative Clauses in Japanese, see Imai (2014a), Kuroda (1992a, b, 2005a, b), Shimoyama (1999), Yoshida and Sano (2001), Watanabe (2004). Both Head External Relative Clauses and Head Internal Relative Clauses exist in languages such as Japanese.

Head External Relative Clauses are illustrated as in (1), while Head Internal Relative Clauses, as in (2):

(1) Head External Relative Clauses
a. Head [……..]　b. […….] Head
(2) Head Internal Relative Clauses
[[….. Head …..] X]　X = nominal element

(1a) is an instance of head-initial languages, while (1b), an example of head-final languages.

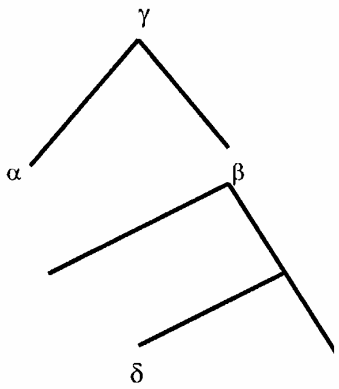
In this paper, we will show that Head Internal Relative Clauses are well explained in terms of Graft advocated by Riemsdijk (1998, 2000, 2001, 2004, 2006, 2010 among others). Numeral expressions involved in Head Internal Relative Clauses are problematic in pivotal relative structures. However, they can be explained with Grafting. We will show this to solve problematic structures with Grafting.

1. What is Grafting?

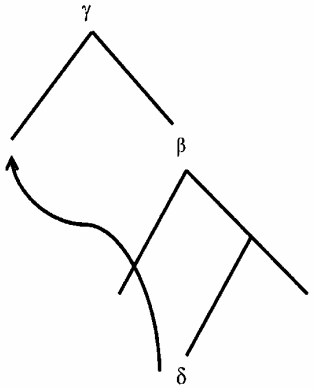
Riemsdijk (1998, 2000, 2001, 2004, 2006, 2010 among others) has developed the graft theory in which a daughter node may be dominated by two mother nodes. It is novel as well as controversial. Riemsdijk (2006) argues that the existence of grafts follows from the two types of Merge, i.e. external and internal, as postulated in Chomsky (2000a, b, 2004a, b, 2005, 2019, 2021a, b). Note that recursive Merge is an important property of the faculty of human language. (Hauser, Chomsky, and Fitch 2002).

Merge takes two elements, say, α and β, which we combine. This operation is called External Merge. Suppose we take α to be a head, then we have {α {α, β}} which is a case of a projection of α. Conversely if we take β to be a head, then we have {β {α, β}}, a case of a projection of β. As a consequence, the head-initial vs head-final in word order follows directly from a choice of either α or β, and we no longer assume the word order parameter. Another type of Merge takes an element already formed by the previous Merge and a new element, then, put them together. This operation is called Internal Merge whose operation constitutes displacement. The difference between External Merge and Internal Merge is illustrated as in (3):

(3) a.

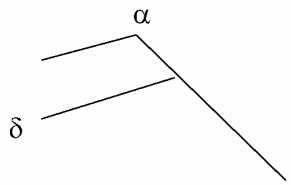


b.

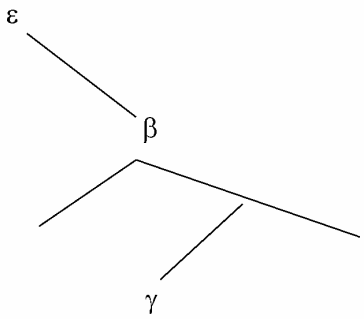


(3a) is an example of External Merge while (3b) is an instance of Internal Merge.
Let us now consider the following configurations:

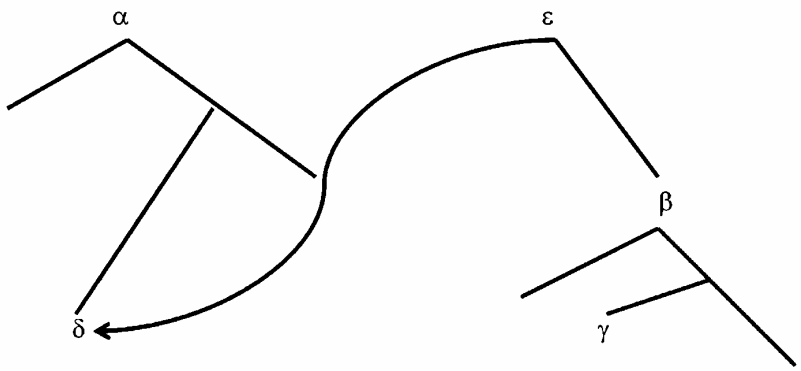
(4) a.



b.



c.



We take δ and ε and put them together by Merge as in (4a and b). As a result, we have (4c), which is what Riemsdijk calls Graft. δ is the shared element in the tree node ε. It is dominated by ε and is a sister of β. At the same time, δ maintains the structural relations it has in its tree α. The operation as illustrated above is called Graft which possesses a dual nature of External Merge and Internal Merge.[1]

2. Head Internal Relative Clauses are Graft structures

In this section, we will consider relative clauses in Japanese in terms of the Graft theory.

Let us assume that Japanese relative clauses are TPs, not CPs, then, it is a consequence of a matter of phases. In English relative clauses, CP follows the Head (the antecedent), then, CP is a phase and only the edge of CP is available for further operations. Relative Clauses in Japanese, however, are best analyzed as TPs following the Head for many reasons such as no overt wh pronouns, thus, no island violations such as a classical subjacency condition. The argument that the relative clauses in Japanese are TPs, not CPs is taken up in the literature such as Kuroda (2005a, b), Murasugi (1994, 2000a, b). Note also that relative clauses in Korean, which are similar to those of Japanese are TPs, not CTs. (Jo 2002). Thus, we could say that relativization

in natural languages is minimally parameterized in such a way that the Head selects either CP or TP as its complement in relative clauses.

Noun Phrases in Japanese are problematic in some respects. It is proposed that Japanese lacks the overt determiner system, thus, nominal projection may not include D[2]. Note that NPs in Japanese have overt Case Markers, hence, it is proposed that a Functional Category, K whose maximal projection is KP. In another proposal, Japanese indeed has DP where Case is assigned to D of DP. We will not get into this argument here.

Let us consider the following example:

(5) Tom-ga/wa [Mary-ga ringo-o katta] no]-o tabeta
Nom/TOP NOM apple ACC buy+Past NO Acc eat+Past
[NO = Nominalizer]
“Tom ate an apple which Mary bought.”

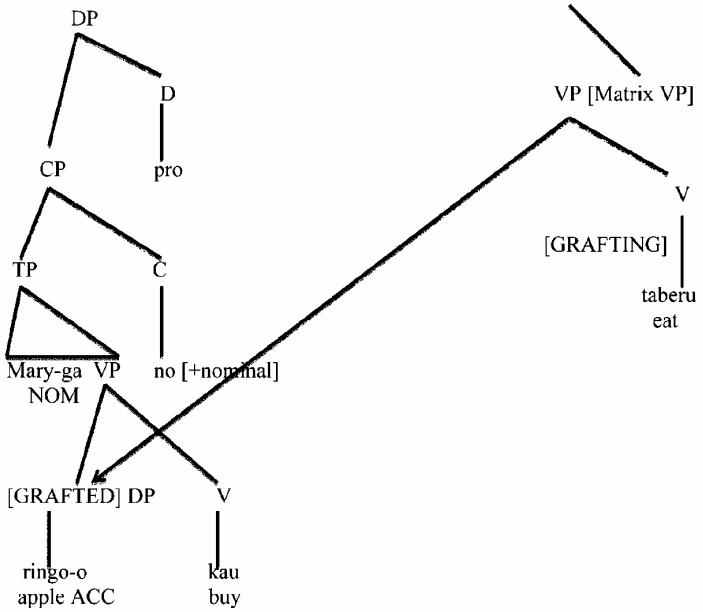
Example (5) is a typical head internal relative clause which is one option of relativization in Japanese. Japanese also has head external relative clauses as in (6) which is the same meaning as (5):

(6) Tom-ga/wa [Mary-ga katta] ringo-o tabeta
NOM/TOP NOM buy+Past apple-ACC eat+Past
“Tom ate an apple which Mary bought.”

Note however that Head Internal Relative Clauses are frequently used in both colloquial as well as written Japanese.

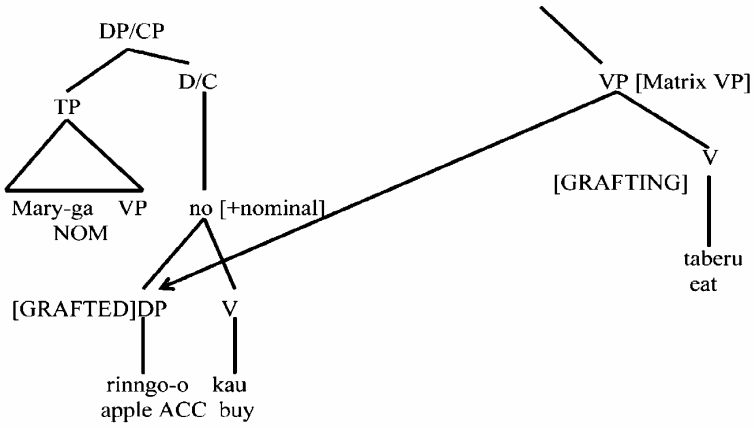
Suppose that Japanese has DP and CP just like English, we will have a structure as in (7) for sentence (5).

(7)



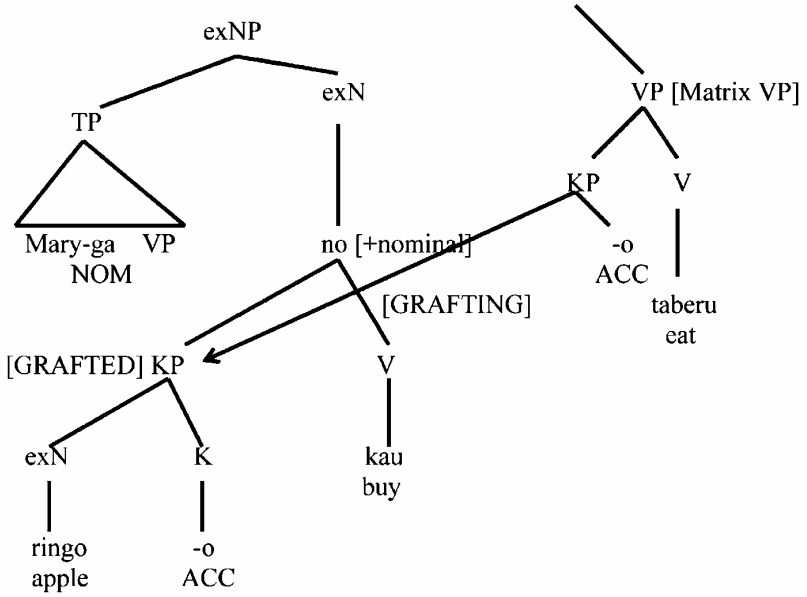
If we take a position of the proposal that Japanese relative clauses are DPs whose inside are TPs, then, we will get the following Grafted tree (8). Note that tree (8) follows from the idea discussed in Imai (2012) that haplology superimposes one projection on the other one.

(8)



Suppose that Japanese does not have DPs, but has a Functional Category KP i.e. Case Phrase which is overtly pronounced. Furthermore, noun phrases are assumed to be extended NPs in Japanese[3], then, we will have structure as in (9):

(9)



(exN, exNP= extended N, NP; K=case)

At this point, it is hard to determine which analysis is tenable for nominal expressions in Japanese, thus, we will leave open it for further research. We can only say that Head Internal Relative Clause structures in Japanese can be explained by Graft. The same thing is said for Head Internal Relative Clauses of other languages.

It is proposed that the Grafting structure is created in one dimension, while a structure including the Grafted Category is created in another dimension. In other words, we can say that linguistic trees in a mental computation are three-dimensional proposed by Riemsdijk. Note that Chomsky (2004a) posits that there are three-dimensional trees. Baker (2001) and Klosek (2011) also pursue the idea of tree-dimensional trees, with which Imai (2014b) develops phrase structure trees are three-dimensional at Narrow Syntax before Spell-Out[4].

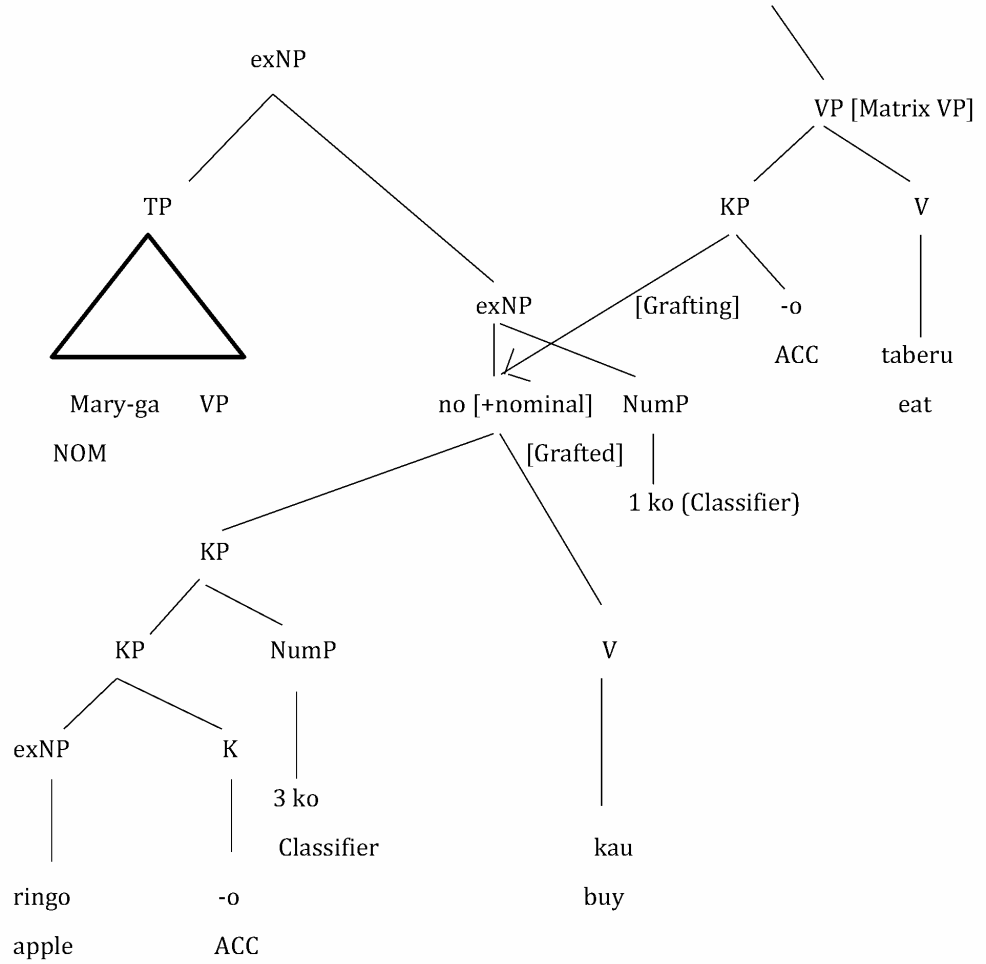
3. Numeral Expressions in Head Internal Relative Clauses

If numeral expressions[5] are involved in head Internal Relative Clauses in Japanese, it shows an interesting consequence in that the split numeral phrase is a Grafted element as illustrated as in (10):

(10)

a. Tom-wa/ga [Mary-ga ringo-o 3 ko katta no]-o 1 ko tabeta.
TOP/NOM NOM apples ACC 3 Classifier buy+PAST NO ACC 1 Classifier eat+PAST
"Tom ate one apple out of three apples which Mary bought."

b.



Numeral expressions in Japanese always have classifiers which English uses similar expressions when one counts uncountable nouns like paper, coffee, wine, etc. All Japanese nouns need classifiers when counting. In (10a), 3 ko (3 + Classifier) in the relative clause, and 1 ko (1 + Classifier) in the main sentence. These numeral expressions refer to ringo (apple). Unexpectedly we cannot make a Head External Relative Clause of (10a) which leads to ungrammatical.

(11) *Tom-wa/ga [Mary-ga katta ringo 3 ko] -o 1 ko tabeta
TOP/NOM NOM buy+PAST apple 3 Classifier ACC 1 Classifier eat+PSAT
"Tom ate one apple out of three apples which Mary bought."

This fact shows that a theory of Graft is needed in Syntax to account for the structures like (11).

4. Concluding Remarks

We have so far observed Head Internal Relative Clauses as Grafts. Though the Graft theory has been controversial, it is indeed necessary that Graft can explain Head Internal Relative Clauses including split numeral expressions.

Notes

Part of sections 1 and 2 is a modified version of Imai (2014a).

1. Chomsky (2019) mentions Parallel Merge and multidominance resulting in multidimensional structures. This kind of operation is nothing as Chomsky argues and he is skeptical about multidominance structures, which is similar to Grafts. As a consequence, Chomsky seems to be skeptical of Grafts.
2. See Fukui and Takano (2005), Fukui and Sakai (2003), and Fukui (2006) on this view about non-DP in Japanese.
3. Treatment of Case is problematic in any model in the past generative grammar in that at which level of representation the Case is assigned. In a widely accepted view, the Case assignment is executed at S-structure in the Principles-and-Parameters model. In the Minimalist Program, Case is assumed to be assigned at Spell-Out.
4. Baker (2001) argues that concerning the three-dimensional trees, tree diagrams are Alexander Calder mobiles, with the lines made of strong wire and words made out of metal sheets (p. 76). If we paraphrase Baker's metaphor, it is realized that all languages have the same design. The difference among languages is that every node swirls around in one language version relative to its position in another language sentence. Klosek (2011) proposes a radical view on three-dimensional tree diagrams. Kolosek argues that by representing syntactic structures three-dimensionally, it will be possible to dispense with all movements, reduce complexity and make universal syntactic representation possible in languages. See also Imai (2014b) for more detail on three-dimensionality in narrow syntax in mental grammar.
5. Numeral expressions in Head Internal Relative Clauses are argued applying Grafts in Meinunger (2015.)

References

Aldridge, E. (2002) “Internally Headed Relative Clauses in Austronesian Languages”, GLOW IN ASIA, National Tsing Hua University, Taiwan, e-proceedings, available on line.

Aldridge, E. (2003) “Remnant Movement in Tagalog Relative Clause Formation,” *Linguistic Inquiry* 34:4, 631-640.

Baker, M. C. (2001) *The Atoms of Language: The Mind’s Hidden Rules of Grammar*. New

York: Basic Books.

Berwick, R.C. and N. Chomsky (2011) “The Biolinguistic Program: The Current State of its Development,” in Di Sciullo and C. Boeckx eds. *The Biolinguistic Enterprise—New Perspectives on the Evolution and Nature of the Human Language Faculty*. Oxford: Oxford University Press, 19- 41.

Chomsky, N. (1995) *The Minimalist Program*, Cambridge, MA: MIT Press.

Chomsky, N. (2000a) “Minimalist Inquiries: the Framework,” in Martain, R.. D., Michaels, and J. Uriagereka, eds., *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, Cambridge, MA: MIT Press. 89-155.

Chomsky, N. (2000b) “Derivation by Phase,” In Inoue, K. ed. *Researching and Verifying an Advanced Theory of Human Language: Explanation of the Human Faculty for Constructing and Computing Sentences on the Basis of Lexical Conceptual Features*, Chiba: Kanda University of International Studies. 1-45. Also in Kenstowicz (2001), 1-52.

Chomsky, N. (2004a) *The Generative Enterprise Revisited – Discussions with Riny Huybregts, Henk van Riemsdijk, Naoki Fukui and Mihoko Zushi*. Berlin: Mouton de Gruyter.

Chomsky, N. (2004b) “Beyond Explanatory Adequacy,” in Belletti, A. ed. *Structures and Beyond, The Cartography of Syntactic Structures*, Volume 3, Oxford: Oxford UP, 104-313.

Chomsky, N. (2005) “Three Factors in Language Design,” *Linguistic Inquiry* 36:1, 1-22.

Chomsky, N. (2007a) “Approaching UG from below,” in U. Sauerland and M. Gaertner eds. *Interfaces + Recursion = Language? Chomsky’s Minimalism and the View from Syntax-semantics*. Berlin/New York: Mouton de Gruyter, 1-30.

Chomsky, N. (2007b) “Biolinguistic Explorations: Design, Development, Evolution,” *International Journal of Philosophical Studies* 15:1, 1-21.

Chomsky, N. (2007c) “Some Simple Evo-devo Theories about Language: How Might They Be True of Language?” in R. Larson, V. Déprez, and H. Yamakido eds. *The Evolution of Human Language*. Cambridge: Cambridge University Press, 45-62.

Chomsky, N. (2010) “Poverty of Stimulus: Unfinished Business,” Lecture presented in the Lecture Series “Sprache und Gehirn – Zur Sprachfähigkeit des Menschen” organized by Angela D. Friederici in the context of the Johannes Guternberg endowed Professiorship Summer 2010 at Johannes-Guterberg University, Mainz, March 24, 2010.

Chomsky, N. (2019) “Some Puzzling Foundational Issues: The Reading Program”, *Catalan Journal of Linguistics*, Special Issue, 263-285.

Chomsky, N. (2021a) “Linguistics Then and Now: Some Personal Reflections”, *Annual Review of Linguistics*, 7, 1-11.

Chomsky, N. (2021b) “Simplicity and the form of grammar”, journal of Language Modelling, 9:1, 5-15.

Citko, B. (2005) “On the Nature of Merge: External Merge, Internal Merge, and Parallel Merge,” *Linguistic Inquiry*, 36:4, 475-496.

Fukui, N. (2006) T*heoretical Comparative Syntax: Studies in Macroprameters*. London: Routledge.

Fukui, N. and H. Sakai (2003) “The Visibility Guideline for Functional Categories: Verb Raisings in Japanese and Related Issues,” *Lingua* Special Issue 113, 321-375.

Fukui, N. and Y. Takano (2000) “Nominal Structure: An Extension of the Symmetry Principle,” in Svenonius, P. ed. *The Derivation of VO and OV*. Amsterdam: John Benjamins, 219-254.

Grosu, A. and F. Landman (1998) “Strange Relatives of the Third Kind,” *Natural Language Semantics* 6, 125-170.

Grosu, A. and K. Hoshi (2019) “Japanese internally-headed and doubly-headed relative constructions, and a comparison of two approaches”, *Glossa*, 4:1, 128, 1-23.

Hauser, M. D., N. Chomsky and W. T. Fitch (2002) “The Faculty of Language: What is it, who has it, and how did it evolve?” *Science* 298 (5598), 1569-1579.

Hiraiwa, K. (2003) “Relativization in Buli,” *Working Papers on Endengered and Less Familiar Languages 4 —Studies in Buli Grammar*, 45-84.

Imai, T. (2012) “Graft as Merge and Head Internal Relative Clauses,” *Tsuru Studies in English Linguistics and Literature*, No. 41, 1-12.

Imai, T. (2014a) “Graft as Merge” t*he Tsuru University Graduate School Review*, No. 18, 31-43.

Imai, T. (2014b) “Merge and Three Dimensional Structures, Ed. by the Editorial Committee for the Research Papers Celebrating the 50th Anniversary of the Department of English, Tsuru University, In *Linguistics, Literature and Beyond: A Collection of Research Papers Celebrating the 50th Anniversary of the Foundation of the Department of English, Tsuru University*, 29-41.

Jo, Mi-Jeung (2002) “The Structure of Relative Clauses in Korean,” *Studies in Generative Grammar* 12, 107-137.

Keenan,E. L. and B. Comrie (1977) “Noun Phrase Accessibility and Universal Grammar,” *Linguistic Inquiry* 8, 63-99.

Kim, Min-Joo (2005) “Formal Linking in Internally-Headed Relatives,” available on line in Ling Buzz, October 14, 2005.

Klosek, J. (2011) “Three-Dimensional Syntax,” linBuzz. http://ling.auf.net/linBuzz/001327

Kuroda, S.-Y. (1992a) *Japanese Syntax and Semantics*. Dordrecht: Kluwer Academic Publishers.

Kuroda, S.-Y. (1992b) “Pivot-Independent Relativization in Japanese” in Kuroda (1992a).

Kuroda, S.-Y. (2005a) *Nihongo kara Mita Seisei Bumpo* (Generative Grammar from the Viewpoint of the Japanese Language), Tokyo: Iwanami Shoten.

Kuraoda, S.-Y. (2005b) “Shujinaizai Kankeisetsu” (Head Internal Relative Clauses), in Kuroda (2005a), 169-236.

Meinunger, A. (2015) “Complexnumeral Expressions: A Plea for Grafts”, *Syntax*, 18:2, 103-123.

Murasugi, K. (1994) “Head-internal Relative Clauses as Adjunct Pure Complex NPs,” In Chiba, S. ed. *Synchronic and Diachronic Approaches to Language*. Tokyo:Kaitakusha.

Murasugi, K. (2000a) “An Antisymmetry Analysis of Japanese Relative Clauses,” in Alexiadou, A., P. Law, A. Meinunger, and C. Wilder eds. *The Syntax of Relative Clauses*. Amsterdam: John Benjamins, 231-263.

Murasugki, K. (2000b) “Japanese Complex Noun Phrases and the Antisymmetry Theory,” in Martin, R. et al. eds. Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik. Cambridge, MA: MIT Press, 211-234.

Narita, H. and K. Fujita (2010) “A Naturalist Reconstruction of Minimalist and Evolutionary Biolinguistics,” *Biolinguistics* 4:4, 356-376.

Riemsdijk, Henk, C. van (1998) “Trees and Scions – Science and Trees.” In *Fest-Web-Page for Noam Chomsky*, 32pp. Cambridge, MA: MIT Press.

Riemsdijk, Henk, C. van (2000) “Free relatives inside out. Transparent Free relatives as Grafts.” In Bozena Rozwadowska ed. *PASE Papers in Language Studies. Proceedings of the 8th Annual Conference of the Polish Association for the Study of English*, 223-233.

Riemsdijk, Henk, C. van (2001) “A Far from Simple Matter. Syntactic Reflexes of Syntax-Pragmatics Misalignments,” In I. Kenesei and R. M. Harnish eds. *Perspectives on Semantics, Pragmatics, and Discourse*. Ameterdam: John Benjamins, 21-41.

Riemsdijk, Henk, C. van. (2004) “Graft is the Logically Missing Case of Merge,” *Visnyk of the Kiev National Linguistic University* 7:5-13.

Riemsdijk, Henk, C. van. (2006) “Grafts Follow from Merge,” in M. Frascarelli ed. *Phases of Interpretation*, Berlin: Mouton de Gruyter 17- 44.

Shimoyama, J. (1999) “Internally Headed Relative Clauses in Japanese and E-type Anaphora,” *Journal of East Asian Linguistics* 8, 147-182.

Vries, M. de. (2005) “Merge: Properties and Boundary Conditions,” *Linguistics in the Netherlands 2005*, 219-230.

Watanabe, A. (2004) “Parameterization of Quantificational Determiners and Head-Internal Relatives,” *Language and Linguistics* 5:1, 59-97.

Yoshida, M. and T. Sano (2001) “Psycholinguistic Studies on Japanese Head Internal Relative Clauses,” In Cuevo, M. C., D. Harbour, K. Hiraiwa, and S. Ishihara eds. *Proceedings of Formal Approaches to Japanese Linguistics 3 (FAJL 3), MIT Working Papers in Linguistics* No. 41, 33-46.

Accepted: December 06, 2021
Revision received: December 07, 2021
Accepted : December 08, 2021