1 Introduction

It has been observed by Saito (1985) and Koizumi (2000) that if multiple constituents are scrambled out of an embedded clause in terms of long-distance scrambling, the result is degraded, as the contrast between (1) and (2) shows (Koizumi 2000: 239):

(1) Hawai-de1 John-ga [Kiyomi-ga \(t_1\) Masami-ni purezento-o katta to] omotteiru (koto) 'John believes that Kiyomi bought a present for Masami in Hawaii.'

(2) Purezento-o3 Masami-ni2 Hawai-de1 John-ga [Kiyomi-ga \(t_1\) \(t_2\) \(t_3\) katta to]

As Koizumi (2000) and Fukui and Sakai (2006; 'F&S') observe, however, "multiple long-distance scrambling" improves significantly if the scrambled element forms an intonational phrase, though we argue here that the relevant phonological phrase is not an intonational phrase but a major phrase (aka "intermediate phrase"). The boundary of a major phrase is often marked by a pause or glottalization. The major phrase is also the domain for catathesis (downstep in McCawley 1968). In (3), the major phrase is italicized and put in parentheses; a major phrase

---

* This is a revised version of the paper presented at FAJL 5. We would like to thank the audience at the conference for helpful comments and discussions on earlier versions of this paper, especially Shin Fukuda, Junko Itô, Armin Mester, Shigeru Miyagawa, Mamoru Saito, and Lisa Selkirk. We would also like to thank Hidehito Hoshi, Norvin Richards and Hideaki Yamashita for helpful comments on a draft of this paper. Remaining errors and omissions are, of course, the sole responsibility of the authors. This work was supported in part by the Japan Society for the Promotion of Science under grant Scientific Research C 22420511 to Ishii.
contains two or more recursively embedded minor phrases, each consisting of one or more non-lexical words plus a lexical word:

(3) (*Purezento-o Masami-ni Hawai-de*) John-ga [Kiyomi-ga katta to] omotteiru (koto)  
  present-ACC Masami-DAT Hawaii-in John-NOM Kiyomi-NOM bought C think (fact)  
  'John believes that Kiyomi bought a present for Masami in Hawaii.'

Koizumi claims that there is vacuous overt verb raising in Japanese and that cases like (3) are derived by scrambling of the remnant VP whose head V has been raised as shown in (4):

(4) [VP *Purezento-o Masami-ni Hawai-de* to] John-ga [Kiyomi-ga to] katta  
  present-ACC Masami-DAT Hawaii-in John-NOM Kiyomi-NOM bought C think (fact)

F&S counter that there is no vacuous overt verb raising in Japanese. Moreover, they show that it is possible to scramble a portion of an alleged VP as long as it forms an intonational phrase (5):

(5) (*Masami-ni Hawai-de*) John-ga [Kiyomi-ga purezento-o katta to] omotteiru (koto)  
  Masami-DAT Hawaii-in John-NOM Kiyomi-NOM present-ACC bought C think (fact)  
  'John believes that Kiyomi bought a present for Masami in Hawaii.'

For this reason they propose that the elements are reanalyzed at PF (extending Marantz’s (1988) Morphological Merger) where they form a PF constituent. Scrambling then applies to this PF constituent. As F&S themselves admit, however, the notion of Phrase-Level Merger is obscure.

This paper presents a prosodic movement analysis of "multiple scrambling" in Japanese. The organization of this paper is as follows. Section 2 argues that there are two kinds of scrambling, *i.e.* syntactic scrambling and prosodic scrambling. It is shown that the latter type of scrambling, which targets a prosodic constituent rather than a syntactic constituent, accommodates "multiple scrambling." Section 3 presents consequences of our analysis. Section 4 discusses the lack of locality effects with prosodic scrambling. Section 5 makes concluding remarks.

## 2 Prosodic Scrambling

We propose that there are two kinds of scrambling in Japanese, one in the syntax proper (involving an XP) and the other at PF (involving a prosodic constituent). We argue if material can scramble syntactically, it does. If scrambling targets material that is not a syntactic constituent, but is a prosodic constituent, then that material moves at PF (we call this movement *prosodic scrambling*). We also argue that the target prosodic constituent is not an intonational phrase, but a major phrase/intermediate phrase. We adopt Itô and Mester's (2007) idea that major phrases in Japanese are just recursive phonological phrases (ϕ’s), as shown below:

(6) ( (...)ϕ (…)ϕ …)ϕ = major phrase (Itô and Mester 2007)
In (1a), since Hawai-de 'Hawaii-in', being a syntactic constituent, can scramble syntactically, it does. (2) cannot be generated by the narrow syntax because it does not involve movement of a syntactic constituent; neither can it be moved at PF because the fronted material is not combined into a single prosodic constituent. (3) cannot be derived syntactically, but it can involve prosodic scrambling because the fronted material forms a prosodic constituent by recursive embedding of multiple \( \varphi \)'s into a single \( \varphi \) (a major phase) as represented in (7):

\[
((\text{Purezento-o})_{\varphi} (\text{Masami-ni})_{\varphi} (\text{Hawai-de})_{\varphi})_{\varphi}
\]

Our analysis predicts that there is a difference between syntactic and prosodic scrambling regarding syntactic conditions and LF interpretations. Syntactic scrambling obeys syntactic conditions, and is interpreted at LF either in its surface position or in-situ (due to radical reconstruction (Saito 1989)). Since prosodic scrambling occurs after syntax (in the PF component), it is not subject to syntactic conditions, and the scrambled material can only be interpreted in situ at LF. The next section shows that this prediction is borne out.

3 Consequences
3.1 Scrambling of a "True Adjunct"


(8) a. Mary-ga [John-ga riyu-mo naku sono setsu-o sinjiteiru to] ometteiru (koto) Mary-NOM John-NOM reason-even without that theory-ACC believe C think (fact) 'Mary thinks [that John believes in that theory without any reason].'
   b.* [Riyu-mo naku] Mary-ga [John-ga t\(i\) sono setsu-o sinjiteiru to] ometteiru (koto)
   reason-even without Mary-NOM John-NOM that theory-ACC believe C think (fact)

(9) a. Mary-wa [Bill-ga naze sono hon-o katta to] itta no Mary-TOP Bill-NOM why that book-ACC bought C said Q
   'Why did Mary say [that Bill bought the book \(t\_i\)]?'
   b.* Naze Mary-wa [Bill-ga t\(i\) sono hon-o katta to] itta no
   why Mary-TOP Bill-NOM that book-ACC bought C said Q

In (8b, 9b), the "true adjuncts" riyu-mo naku 'without any reason' and naze 'why' in the matrix domains can only be associated with the matrix clauses but not with the embedded clauses. In

---

1 A question remains as to what motivates prosodic scrambling to be movement of two or more phonological phrases. It is worth pointing out, however, that our proposal is roughly parallel to Zec and Inkelas's (1990) analysis of Heavy NP-shift in English. They claim that a "shifted" noun phrase must contain at least two phonological phrases, while any attempt to shift an NP consisting of only a single phonological phrase is ungrammatical, as shown in (i):

(i) a. Mark showed to John ((some letters)_{\varphi} (from Paris)_{\varphi})_{\varphi}.
   b.*Mark showed to John (some letters)_{\varphi}.

The main difference between Heavy NP-shift in English and scrambling in Japanese is that the movement is rightwards in the former but leftwards in the latter. We leave more detailed discussion for future research.
other words, (8b, 9b) are deviant with the interpretations of (8a, 9a). As pointed out by Koizumi (2000: 243), however, when a true adjunct is scrambled with another element with which it forms a prosodic constituent, the result becomes acceptable, as shown in (10, 11). Under our analysis, prosodic scrambling takes place in the phonological component and thus has no effect on LF. The scrambled "true adjuncts" in (10, 11) can be associated with the embedded clause:

(10)a. \(( Ronnie-mo naku) (sono setsu-o) (reason-even-without that-theory-ACC)\) Mary-ga John-ga sinjiteiru to omotteiru (koto) 'Mary thinks [that John believes in that theory without any reason].'

b. \(( Sono setsu-o) (riyu-mo naku) (that-theory-ACC reason-even-without)\) Mary-ga John-ga sinjiteiru to omotteiru (koto) 'Why did Mary say [that Bill bought the book]?'

(11)a. \(( (Naze) (sono hon-o) (why that book-ACC)\) Mary-wa [Bill-ga katta to] itta no 'Why, indeed, did Bill say [that Bill bought the book]?'

b. \(( (Sono hon-o) (naze) (that book-ACC why)\) Mary-wa [Bill-ga katta to] itta no

### 3.2 Scrambling of a Nominative Subject

Saito (1985) has claimed that scrambling of a nominative subject is not possible:

(12)a. John-ga [sono ressha-ga Tokyo-ni tsuita to] omotteiru (koto) 'John thinks that that train has arrived in Tokyo.'

b. *Sono ressha-ga John-ga [t\_i Tokyo-ni tsuita to] omotteiru (koto)

(13)a. John-ga [shacho-no hoshin-ga shain-no urami-o katteiru to] 'John thinks that the president’s policy is making an enemy of the employees.'

b. *Shacho-no hooshin-ga John-ga [t\_i shain-no urami-o katteiru to]

It should be noted that it is clear from the semantics that the preposed nominative subjects *sono ressha-ga* 'that train-NOM' and *shacho-no hoshin-ga* 'president-GEN policy-NOM' are to be interpreted as the subjects of the embedded clauses. When a nominative subject scrambles with another element and they form a major phrase, however, the result is acceptable as shown below:

(14)a. \(( (Sono ressha-ga) (Tokyo-ni) (that train-NOM Tokyo-in)\) John-ga [tsuita to] omotteiru (koto) 'John thinks that that train has arrived in Tokyo.'
b. \(((\text{Shacho-no})\varphi(\text{hoshin-ga})\varphi(\text{shain-no})\varphi(\text{urami-o})\varphi)\varphi\) John-ga [katteiru to] (president-GEN policy-NOM employee-GEN hostility-ACC) John-NOM earn C omotteiru (koto) think (fact)

'John thinks that the president’s policy is making an enemy of the employees.'

Under our analysis, since prosodic scrambling takes place at PF, it is not subject to the syntactic constraint on scrambling of a nominative phrase. Hence, (14a, b) are acceptable.

### 3.3 Wh-scrambling

Takahashi (1993) shows that when a wh-phrase is (syntactically) scrambled out of an interrogative clause by itself as shown in (15), the dominant reading is one where the scrambled wh-phrase has matrix scope:

\[(15)\text{Dono hon-o} \quad \text{John-ga [Mary-ga toshokan-kara ti karidashita ka] shiritagatteiru no which book-ACC John-NOM Mary-NOM library-from borrowed Q want-to-know Q}
\]

'Which book does John want to know whether Mary borrowed from the library?'

*?'Does John want to know which book Mary borrowed from the library?'

When the wh-phrase is scrambled with additional material and the fronted material forms a major phrase, however, only the embedded scope reading is allowed as shown in (16). This follows from our analysis, since prosodically scrambled material can only be interpreted in situ at LF:

\[(16)\text{((Dono hon-o)\varphi(Toshokan-kara)\varphi)\varphi} \quad \text{John-ga [Mary-ga karidashita ka] shiritagatteiru no which book-ACC library-from John-NOM Mary-NOM borrowed Q want-to-know Q}
\]

*?'Which book does John want to know whether Mary borrowed from the library?'

'Does John want to know which book Mary borrowed from the library?'

### 3.4 Adjacency Condition on Long Distance Scrambled Phrases

Boeckx and Sugisaki (1999) observe that in "multiple long distance scrambling," elements undergoing scrambling cannot be split by an element in the higher clause. The following examples are taken from Hiraiwa (2010: 154):

\[(17)a. \text{Reizoko-kara ringo-o Naomi-ni Ken-ga [Yuko-ga nusunda to] itsuketa fridge-from apple-ACC Naomi-DAT Ken-NOM Yuko-NOM stole C told}
\]

'Ken told Naomin that Yuko stole some apples from the fridge.'

\[b. \text{Reizoko-kara Naomi-ni ringo-o Ken-ga [Yuko-ga nusunda to] itsuketa fridge-from Naomi-DAT apple-ACC Ken-NOM Yuko-NOM stole C told}
\]
In (17), reizoko-kara 'fridge-from' and ringo-o 'apple-ACC' are scrambled out of the embedded clause through long distance scrambling. While (17a) is acceptable, (17b), where the matrix element Naomi-ni 'Naomi-DAT' splits up the two scrambled phrases, is not. Under our analysis, 'multiple long distance scrambling' is a PF operation, and so the scrambled elements reizoko-kara ringo-o ‘fridge-from apple-ACC’ must form a prosodic constituent (a major phrase) before prosodic scrambling as represented in (18); they cannot be intervened by any other element:

(18) \((\text{Reizoko-kara}) \phi (\text{ringo-o}) \phi \)  
\[ \text{fridge-from apple-ACC} \]  
Nomai-ni Ken-ga [Yuko-ga nusunda to] iitsuketa  
[John\text{-no} hihan-o] \[ \text{Nishigauchi (2002), (Miyagawa 2005: 193)} \]

3.5 Condition C of the Binding Theory

As pointed out by, among others, Van Riemsdijk and Williams (1981), Lebeaux (1988), and Chomsky (1995), there is an argument/adjunct asymmetry with reconstruction effects regarding binding facts in English wh-movement. Nishigauchi (2002) and Miyagawa (2005, 2006) observe that there is a similar argument/adjunct asymmetry with reconstruction effects in Japanese scrambling, as the contrast between (19a) and (19b) shows (Miyagawa 2005: 193):

(19) a.??/?*[Minna-no \[\text{John\text{-no} hihan-o} \] \[ \text{kare}_i\text{-ga} \[ \text{Hanako-ga t}_j \text{osiete-kureta to} \] \] \[ \text{ita} \] \[ \text{everyone-GEN John-GEN criticism-ACC he-NOM Hanako-NOM told-him} \] \[ \text{C said} \] 'Everyone’s criticism of John, he\_i said that Hanako told him.'

b. [[Minna-ga \[\text{John\text{-kara kakushite-ita} hihan-o} \] \[ \text{kare}_i\text{-ga} \[ \text{Hanako-ga t}_j \text{oshiete-kureta to} \] \] \[ \text{ita} \] \[ \text{told-him \_ C said} \] 'The criticism that everyone was hiding from John, he\_i said that Hanako told him.'

While John and kare 'he' can be coreferential in (19b), they cannot be coreferential in (19a). The R-expression John is an argument of the noun hihan 'criticism' in (21a), whereas it is within the adjunct modifying hihan ‘criticism’ in (19b). Assuming Lebeaux’s analysis, Nishigauchi and Miyagawa claim that in (19a), John must be merged with hihan 'criticism' when hihan 'criticism' first appears in the complement position of oshiete-kureta 'told-him'. The copy of John is visible in this position, which results in a Condition C violation. In (19b), on the other hand, John may be merged after scrambling has taken place; there is no Condition C violation.

We observe that such argument/adjunct asymmetry disappears with ‘multiple long-distance scrambling’ as shown in (20). Crucially, (20b) violates Condition C, even though John is within the adjunct modifying hihan 'criticism':

(20) a.??/?*((Okuno tomodachi-ni) \phi (\text{minna-no}) \phi (\text{John\text{-no} hihan-o}) \phi \) \[ \text{kare}_i\text{-ga} \] \[ \text{(many friend-to everyone-GEN John-GEN criticism-ACC) he-NOM} \] \[ \text{[Hanako-ga barashita to] \text{ita} \} \] \[ \text{Hanako-NOM disclosed C said} \] Lit. 'Everyone’s criticism of John\_i to many friends, he\_i said that Hanako disclosed.'
Prosodic Scrambling

b. **/(Okuno tomodachi-ni) ϕ (minna-ga) ϕ (Johni-kara) ϕ (kakushite-ita) ϕ (hihan-ō) ϕ ϕ**
   
   *(many friend-to everyone NOM John-from was-hiding criticism ACC)*
   
   karei-ga [Hanako-ga barasita to] itta
   
   Lit. 'The criticism that everyone was hiding form Johni to many friends, hei said that Hanako disclosed.'

The deviancy of (20b) is unexpected under the analysis proposed by Lebeaux, Nishigauchi, and Miyagawa. Under our analysis, scrambling in (20) takes place at PF because the moved constituent is not syntactic but prosodic (a major phrase). The entire scrambled phrase in (20b), therefore, is interpreted *in-situ* at LF, which leads to a Condition C violation.

### 3.6 Scope Economy

It has been pointed out by, among others, Tada (1993) and Miyagawa (2005, 2006, 2008) that long-distance scrambling does not lead to a new scope relation (Miyagawa 2005: 201):

(21) **Daremo-ni____dareka-ga** [John-ga t_i kisushita to] omotteiru
   
   *everyone-DAT someone-NOM John-NOM kissed C think*
   
   Lit. 'Everyone, someone thinks that John kissed.'
   
   "everyone>someone, someone>everyone"

While the existential quantifier **dareka-ga** ‘someone-NOM’ may take scope over the universal quantifier **daremo-ni** ‘everyone-DAT’, the inverse scope reading is not allowed; the scrambled phrase **daremo-ni** ‘everyone-DAT’ must be reconstructed to its original position at LF. Miyagawa (2005, 2006, 2008) observes, however, that if the embedded subject is replaced by a quantificational expression, the sentence becomes ambiguous (cf. Miyagawa 2008: 20):

(22) **Daremo-ni____dareka-ga** [itsuka futari-no-kodomo-ga t_i kisushita to] omotteiru
   
   *everyone-DAT someone-NOM sometime two-GEN-kids-NOM kissed C think*
   
   Lit. 'Everyone, someone thinks that at some point two kids kissed.'
   
   "OK/??everyone>someone, someone>everyone"

Miyagawa argues that the contrast between (21) and (22) follows from Fox’s (2000) Scope Economy, which claims is that optional application of QR is possible if it leads to a new scope relation. Miyagawa assumes that scrambling of a quantifier counts as an instance of overt QR. In (21), scrambling of **daremo-ni** ‘everyone-DAT’, which does not create any new scope relation, does not count as overt QR due to the Scope Economy; **daremo-ni** 'everyone-DAT' cannot take scope over **dareka-ga** 'someone-NOM' in the matrix subject position. In (22), on the other hand, **daremo-ni** 'everyone-DAT' first moves to the vP edge, where it takes scope over **futari-no kodomo-ga** 'two-GEN-kids-NOM', then moves to the CP edge, where it again creates a new scope relation relative to **itsuka** 'sometime'. These movement operations are licensed as QR. **Daremo-ni** 'everyone-DAT' further moves across another quantifier, **dareka-ga** 'someone-NOM' in the matrix clause. This movement also leads to a new scope relation and thus counts as QR; the scrambled
quantifier *daremo-ni* 'everyone-DAT' can take scope over *dareka-ga* 'someone-NOM'. We observe that such scope economy effects disappear with "multiple long-distance scrambling":

\[(\text{Daremo-ni})ϕ (\text{sono hon-o})ϕ)ϕ \text{ dareka-ga [itsuka futari-no-kodomo-ga ageta to]}\]
\((\text{everyone-DAT that book-ACC}) \text{ someone-NOM sometime two-GEN-kids-NOM gave C omotteiru}
\)

'thinks

'Someone thinks that at some point two kids gave that book to everyone.'

*?everyone>someone, someone>everyone,

Although the embedded clause contains two quantified expressions *itsuka* 'sometime' and *futari-no-kodomo-ga* 'two-GEN-kids-NOM', *daremo-ni* 'everyone-DAT' cannot take scope over the matrix subject *dareka-ga* 'someone-NOM', which is unexpected under Miyagawa’s scope economy account. Under our analysis, prosodic scrambling takes place at PF and *daremo-ni* 'everyone-DAT' can only be interpreted in-situ; it cannot take scope over the matrix subject.

4 Locality Constraints

Saito (1985) observes that "normal" long-distance scrambling is sensitive to island constraints like the Complex NP Constraint and the Adjunct Condition, as shown in (24b, c) and (25b, c), though the island effects with scrambling are weak for some unknown reasons. Japanese scrambling is also subject to the left-branch condition; no genitive phrase can be scrambled out of a nominal phrase, as shown in (26b). In (26b), the genitive phrase *Suzy-no* 'Suzy-GEN' is scrambled out of the nominal phrase:

\[(\text{Bill-ni}) [\text{sono hon-o watsash wasureta] hito-ó omotteiru (koto)\]
\(\text{Mary-NOM Bill-DAT that book-ACC give forgot person-ACC look-for (fact) }
\)

'Mary is looking for the person who forgot to give that book to Bill.'

\[(\text{Bill-ni}) [\text{sono hon-o watsash wasureta] hito-ó omotteiru (koto)\]
\(\text{Mary-NOM that book-ACC give forgot person-ACC look-for (fact) }
\)

'Mary is angry because John gave that watch to Bill.'

\[(\text{Bill-ni}) [\text{sono hon-o watsash wasureta] hito-ó omotteiru (koto)\]
\(\text{Mary-NOM that book-ACC give forgot person-ACC look-for (fact) }
\)

'Mary is angry because John gave that watch to Bill.'

\[(\text{Bill-ni}) [\text{sono hon-o watsash wasureta] hito-ó omotteiru (koto)\]
\(\text{Mary-NOM that book-ACC give forgot person-ACC look-for (fact) }
\)

'John thinks that Mary read Suzy's book.'
We observe that if multiple elements forming a major phrase are preposed out of islands, the acceptability improves, as shown in (27-28). We also observe that when the genitive phrase is scrambled out of a nominal phrase with additional material and form a major phrase, the result becomes better, as shown in (29) (though it is still awkward):

(27) \((\text{Bill-ni}\varphi (\text{sono hon-o})\varphi )\varphi\) Mary-ga [watashi wasureta hito]-o sagashiteiru (koto)
\((\text{Bill-DAT that book-ACC})\) Mary-NOM give forgot person-ACC look-for (fact)
'Mary is looking for the person who gave that book to Bill.'

(28) \((\text{Bill-ni}\varphi (\text{sono tokei-o})\varphi )\varphi\) Mary-ga [John-ga ageta kara] okotteiru (koto)
\((\text{Bill-DAT that watch-ACC})\) Mary-NOM John-NOM gave because be-angry (fact)
'Mary is angry because John gave that watch to Bill.'

(29) \(??(\text{Mary-ga}\varphi (\text{Suzy-no})\varphi )\varphi\) John-ga [hon-o yonda to] omotteiru (koto)
\(\text{Mary-NOM Suzy-GEN John-NOM book-ACC read C think} \) (fact)
'John thinks that Mary read Suzy's book.'

As we mentioned in section 1, when multiple constituents are scrambled out of an embedded clause in terms of syntactic long-distance scrambling, the result is degraded. Hence, if (27-28) were derived by syntactic scrambling, they should be worse than (24b, c) and (25b, c), respectively, where only one constituent is scrambled out of an opaque domain. The result, however, is the opposite of what any syntactic scrambling analysis predicts. As for the left branch condition, if (29) were derive by syntactic long-distance scrambling, the result should be as bad as (26b). Our prosodic scrambling analysis, on the other hand, can account for this fact. When a syntactic constituent is scrambled, it is scrambled in the narrow syntax and obeys the expected syntactic conditions. When a prosodic constituent is scrambled, on the other hand, it is scrambled at PF and therefore insensitive to any syntactic locality constraints.\(^2\)

5 Conclusion

In this paper, we have proposed that there are two kinds of scrambling in Japanese, i.e. syntactic scrambling and prosodic scrambling. Unlike syntactic scrambling which targets an XP, prosodic scrambling targets a major phrase and ignores the usual syntactic constraints. It was also shown that prosodically scrambled elements are interpreted as if they were in-situ.

References


---

\(^2\) This immunity to syntactic islands is also attested with movement of prosodic constituents in Classical Greek (Agbayani & Golston 2010).

Brian Agbayani, Chris Golston
California State University, Fresno
Department of Linguistics
5245 N. Backer Ave.
Fresno, CA 93740-8001
USA
bagbayan@csufresno.edu
chrisg@csufresno.edu

Toru Ishii
Meiji University/ Harvard University
School of Arts and Letters
1-1 Kandasurugadai
Chiyoda-ku, Tokyo 101-8301
JAPAN
tishii@kisc.meiji.ac.jp