

ERASABILITY AND INTERPRETATION

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Abstract. This paper corroborates the interpretability proposal of Chomsky (1995) with evidence from scrambling in Japanese and German. First it is shown that scrambling in Japanese is semantically vacuous, whereas scrambling in German is semantically contentful. Chomsky's proposal then predicts that the feature driving Japanese scrambling is erased after checking, while the corresponding feature in German remains visible, specifically for the Shortest Attract condition. Looking at patterns of movement that result in overlapping paths, this prediction is seen to be correct.

1. Introduction

The typical student handles the information he or she learns in a very selective way according to the following principle: Remember things only as long as they're relevant. If something was relevant only for the homework, forget it immediately afterwards; if something might be relevant for the final exam, remember it until the end of the semester.

Chomsky (1995) proposes that the language faculty handles information as economically as the typical student: Syntax, the computational system, forgets features immediately after they are checked, unless they're relevant for interpretation. The argument Chomsky makes to support this conclusion is conceptual, and I summarize it below. The main purpose of this paper, however, is to corroborate Chomsky's claim with empirical observations. I argue that there is a case where we can empirically compare two types of movement that seem to differ from each other with respect to no other relevant property except whether they have a semantic effect. Namely, I compare scrambling in German with scrambling in Japanese and argue that the syntactic and semantic properties of the two differ in the way predicted by Chomsky's suggestion if Japanese scrambling isn't relevant for semantics but German scrambling is.

* The idea for this paper came to me in a late-night conversation with Joachim Sabel some time in 1995. Please see Grewendorf & Sabel 1996 for an interesting, different view of many of the facts analyzed in sections 3 and 4 of this paper. In subsequent years, I discussed the proposal with numerous linguists and received many valuable suggestions. I particularly remember those of Jonathan Bobaljik, Noam Chomsky, Sam Epstein, Danny Fox, Günther Grewendorf, Gereon Müller, David Pesetsky, Mamoru Saito, Susi Wurmbrand, Kazuko Yatsushiro, and the two anonymous *Syntax* reviewers. Earlier versions of the paper were presented at the University of Frankfurt, the Zentrum für Allgemeine Sprachwissenschaft in Berlin, in the MIT LingLunch Series, at Formal Approaches to Japanese Linguistics 2 at the Tohoku Gakuin University in Sendai, and at the Workshop on the Minimal Link Condition at the University of Potsdam. I'm very grateful to Kazuma Fujimaki, Yasuo Ishii, Ayumi Matsuo, Shigeru Miyagawa, Masao Ochi, Satoshi Oku, and Kazuko Yatsushiro for patiently sharing their intuitions on Japanese examples with me, and to Elizabeth Laurençot for proofreading this paper more than once. Finally, I'm thankful for a Postdoctoral Fellowship of the Japanese Society for the Promotion of Science for financially supporting me while I was completing this paper.

The conceptual argument leading Chomsky (1995:279) to propose that a feature's semantic content affects its syntactic properties starts from the virtually uncontroversial observation that a phrase marker's features can possibly be relevant for articulation, interpretation, and syntactic derivation. Mostly, features are only relevant for one of the three domains. However, in some cases, syntactic and semantic properties correlate, supporting the assumption that the same feature is relevant for syntax and interpretation (for example, in *wh*-phrases).¹ Hence, there is a separation among the formal features into those with semantic content — the interpretable ones — and those without semantic content — the uninterpretable ones.

In conjunction with the ban against nonrecoverable deletion,² the interpretability dichotomy has an effect on the syntactic computation, as Chomsky elaborates. Deletion of interpretable features in the syntax should be blocked because they wouldn't be recoverable, whereas deletion of uninterpretable features should be possible and maybe even forced, as Chomsky assumes.³

Because Chomsky's argument is conceptually interesting, a natural question that arises is whether it has empirical consequences. Chomsky (1995) points out one such consequence by relying on data from raising constructions — namely, that multiple movement checking the same feature is only possible if the feature is +interpretable.⁴ Other consequences of the interpretability proposal are seen in the following case: two comparable

¹ Chomsky (1995:230) also suggests that the features relevant for articulation are disjoint from those relevant for syntax or interpretation. The truth of this assertion is not relevant for our current purposes.

² It doesn't seem certain to me whether there is a real need for a ban against nonrecoverable deletion in the theory of Chomsky (1995). It is obviously a necessity in a theory where deletion applies freely. Otherwise, an enormous number of ambiguities would be expected for virtually every sentence (see Katz & Postal 1964:81 and Chomsky & Lasnik 1977). But if deletion is, as Chomsky (1995) assumes, a tightly restricted operation, the ambiguity problem doesn't arise. Therefore, the evidence presented here showing that interpretability affects syntax seems even more surprising.

³ Sam Epstein (personal communication) points out that Chomsky's reasoning doesn't always explain that an uninterpretable feature must be deleted the first time it is checked, though that is what Chomsky assumes to be the case. Specifically, because uninterpretable features only need to be invisible at the interface level, an uninterpretable feature could be checked several times in a derivation without being deleted, as long as it is deleted the last time that it is checked in this derivation. Epstein's point is well-taken; however, the arguments in this paper are independent of the question whether the possibility he raises exists or not.

⁴ Specifically, Chomsky (1995:284) makes use of interpretability while explaining that A-movement in English cannot take place from a Case position to another Case position: In (ia), the embedded subject *John* raises through the lower subject position before it reaches the subject position of the embedded finite verb. However, as (ib) shows, once the subject reaches the subject position of a finite verb, it cannot raise any further. Chomsky proposes that movement of the subject is driven by two features, the interpretable D-feature and the uninterpretable Case-feature. If the subject moves to a nonfinite Infl, the D-feature alone is checked. But if movement is to a finite Infl, both Case and the D-feature must be checked. Because Case must be erased after checking, the subject cannot move from one finite Infl to a higher one as in (ib).

- (i) a. It seemed that John₁ was considered t_1 to be t_1 in the room.
 b. *John₁ seemed that t_1 was considered t_1 to be t_1 in the room.

movements, one involving checking only of an uninterpretable feature and the other involving checking only of an interpretable feature. I propose that scrambling in Japanese in comparison to scrambling in German constitutes such a case. Previous literature suggests that the two movement operations might differ with respect to interpretability: On the one hand, Saito (1989), Tateishi (1994), and Fukui (1993) express the opinion that scrambling in Japanese is semantically vacuous. On the other hand, Lenerz (1977), who credits Behaghel (1909) with the original observation, Kratzer (1989), Diesing (1992a), and Moltmann (1991) show that German scrambling affects interpretation. In section 2 of this paper, I corroborate the difference between Japanese and German scrambling with direct comparisons and argue that the semantic difference reflects a difference of the features driving scrambling in the two languages. In section 3, I show that Chomsky's interpretability proposal predicts a difference between the two movements with respect to whether a checked scrambling feature is visible for Shortest Attract, and I demonstrate that the predicted difference is found between Japanese and German scrambling. In section 4, I show two further predictions of this approach, which are also shown not to arise on two otherwise conceivable alternatives to my proposal. If the proposed difference between German and Japanese is correct, the following are natural further questions that one might pursue: how is the difference acquired, and how do other scrambling languages pattern? I leave both questions largely open for future research, but in section 5 I offer a speculation of what kind of evidence a learner might use to decide whether scrambling is interpretable.

Before I embark onto the main argument, let me briefly remark on the assumption that scrambling is driven by a feature. I assume that scrambling is driven by a scrambling feature that may optionally be assigned to certain lexical items, marking them as either phrases that must undergo scrambling or as landing sites for scrambling. This assumption is not universally held,⁵ although it has recently been argued for for both German and Japanese by Takano (1992, 1994), Kitahara (1994, 1997:77–82), and Müller (1996:301–324, 1998:271–293) and in more detail for Japanese by Oka (1996). In this paper, I don't repeat their arguments in detail, but many of their facts are discussed in section 4 to make two related points; namely, that there is only one feature in German and

Chomsky's analysis supports his interpretability proposal empirically, but it relies on the additional assumption that Case and the D-feature must be checked by the same phrase, to block a derivation of (ii) where *Mary* checks the EPP-feature and *a man* checks the Case feature of the finite Infl. Therefore, the argument for interpretability offered in this paper is more direct.

(ii) *[Mary]₁ seemed to *t*₁ to be a man in the garden.

⁵ For example, Fukui and Saito (1998) and Bošković and Takahashi (1998) develop accounts of scrambling as a type of movement not driven by a feature. I am skeptical of these proposals not only because of the empirical evidence for a scrambling feature offered in the references cited, but also because the inelegance of an optional scrambling feature is dispensed with only at the cost of introducing a new operation quite distinct from feature-attraction-based movement to bring about a quite similar effect.

Japanese that drives all instances of scrambling, and that this feature is distinct from the feature that drives topicalization in German. For now, I refer to the feature that drives scrambling as the scrambling feature because I don't want to preempt the question of where else this feature might be relevant.

2. Semantic Effects of Scrambling

In this section, I argue that the feature driving scrambling in Japanese has no semantic content.⁶ Such a negative claim is hard to argue for. It is impossible to prove the absence of any semantic effect whatsoever, at least until a finite list of possible semantic effects has been compiled. However, I show that the most plausible candidate for a semantic effect is absent, and I then appeal to the intuition expressed by many native Japanese linguists that scrambling is semantically vacuous. The one aspect of interpretation that I argue is *not* affected by scrambling in Japanese is the Topic-Focus-Background structure of sentence meaning. One reason that it is plausible to assume that Japanese scrambling would show an effect on interpretation in this domain is that German scrambling does. Therefore, I compare German and Japanese examples directly in the following argument. A second reason is that it has sometimes been claimed that Japanese scrambling affects this aspect of interpretation (Miyagawa 1996, 1997).

2.1 Object indefinites

The most clear-cut case showing that Japanese scrambling doesn't have the same effect on interpretation as German scrambling is scrambling of object indefinites. Consider first the German examples in (1). The aspect of interpretation affected in German is whether indefinites allow an existential or a generic interpretation, as shown by Kratzer (1989), Moltmann (1991), and Diesing (1992a). The unscrambled indefinite in (1a) allows both the generic and the existential interpretation, whereas the scrambled indefinite in (1b) allows only the generic interpretation. In (2) the verb is a verb of creation, which is conceptually incompatible with a generic reading of the object. Therefore, scrambling of the object, as in (2b), is odd.⁷

⁶ It is well-known that scrambling in Japanese (and German, as well) gives rise to more possible scopal construals than the base order. However, this is not a semantic effect of the scrambling feature but rather is a general property of movement chains (Jackendoff 1972, Aoun & Li 1993, Frey 1993). For example, it might reflect the optional possibility of reconstruction.

⁷ An anonymous reviewer points out that example (i) seems biased towards a generic reading independently of scrambling, which might obscure the judgment. However, the reviewer's concern doesn't arise for example (1) because the object of *like* is animate and easily allows an existential reading. The observation that the object of *like* is biased towards a generic reading when it is inanimate probably reflects that, according to usual world knowledge, people rarely like just individual inanimate entities — for example, the three bananas on my table —, but rather like kinds of inanimate entities — for example, the banana fruit.

(i) I like bananas.

- (1) a. weil die Susi Professoren mag (generic, existential)
 because the Susi professors likes
 ‘... that Susi likes professors’
 b. weil Professoren₁ die Susi t₁ mag (generic, *existential)
 because professors the Susi likes
- (2) (Diesing 1992a:112)
 a. daß Otto immer Bücher über Wombats schreibt (existential)
 that Otto always books about wombats writes
 b. #daß Otto [Bücher über Wombats]₁ immer t₁ schreibt
 that Otto books about wombats always writes
 (*existential)

Now look at the Japanese examples in (3) and (4), which are translations of the German ones in (1) and (2). Here scrambling doesn’t affect whether the existential reading for the indefinite is possible: The unscrambled object in (3a) as well as the scrambled object in (3b) allow both generic and existential interpretations.

- (3) a. Kazuko-ga sensei-o sukina (koto) (generic, existential)
 Kazuko_{NOM} teacher_{ACC} likes fact
 ‘Kazuko likes teachers.’
 b. sensei-o₁ Kazuko-ga t₁ sukina (koto) (generic, existential)
 teacher_{ACC} Kazuko_{NOM} likes fact
- (4) a. Taroo-ga itsumo wombatto-ni tsuite-no hon-o kaiteru
 Taroo_{NOM} always wombat_{DAT} about_{GEN} book_{ACC} is-writing
 (koto)
 fact (existential)
 b. Taroo-ga [wombatto-ni tsuite-no hon-o]₁ itsumo t₁ kaiteru
 Taroo_{NOM} wombat_{DAT} about_{GEN} book_{ACC} always is-writing
 (koto)
 fact (existential)

To account for these facts, I adopt the approach of von Fintel (1994) and Büring (1996).⁸ They argue that German scrambling marks discourse topics. Within the particular assumptions of this paper, their claim amounts to saying that the

⁸ An anonymous reviewer asks about analyses of the generic/existential ambiguity in terms of scope such as those suggested by Kratzer (1989) and Diesing (1992a). Under such an analysis, the difference between German and Japanese observed here would have to be explained in terms of whether a scrambled phrase can reconstruct (i.e., Japanese) or not (i.e., German). The reviewer points out that a consequence of my claim in footnote 6 is that scrambling can optionally reconstruct. In particular, the observation that the existential reading is available for scrambled indefinites in Japanese then just shows that here too reconstruction is available, and doesn’t bear the interpretability of the scrambling feature. The reviewer’s suggestion is an interesting one to pursue, but notice that it’s left open why scrambled indefinites in German cannot reconstruct to receive an existential interpretation, whereas they can in Japanese. One way to answer this question is to make use of interpretability again in the way hinted at in section 5, but other open questions would remain (for example, Frey’s (1993) data). For this reason, and also for the reasons von Fintel (1994) and Büring (1996) give, I adopt the account of the generic/existential contrast they develop.

German scrambling feature contributes topichood to the interpretation of a phrase. From this alone, von Stechow (1994) argues that the semantics of topics predicts that scrambled indefinites receive a generic interpretation.

For a brief sketch of von Stechow's (1994) account, let us first see how the observed interpretation of (1b) and (2b) is predicted and then see what rules out other interpretations. Look at (5a), which is roughly the LF representation of (2b).⁹ The topic marking on the object of (5a) presupposes that (5a) is uttered in a context *C* where books about wombats are relevant, and this presupposition forces accommodation of *C* when it occurs out of context. The generic quantifier, which is always restricted to situations that are contextually relevant, in (5a) picks up the restriction to *C*, which leads to the interpretation given in (5b) and paraphrased in (5c). This is the correct interpretation.

- (5) a. $\text{Always}_{C, [\text{Otto}]_F} \text{ writes } [\text{books about wombats}]_T$
 b. $C = \{s \mid \text{in } s, \text{ somebody does something to books about wombats}\}$
 $\text{Always}_s [s \in C]_{\text{RESTRICTOR}} [\text{Otto writes books about wombats}]_{\text{NUCLEAR SCOPE}}$
 c. 'Always in a situation *s*, if there's a book about wombats that somebody does something to in *s*, it's Otto writing it.'

Von Stechow (1994) doesn't address the question of how to rule out other interpretations for sentences like (1b) and (2b). However, it seems that a bare plural can only be used to refer to parts of a before-mentioned group, if the bare plural appears to be restricting an adverbial quantifier. Otherwise a definite determiner must be used, as shown in (6). Example (7) involves quantification over situations, and the bare plural is acceptable.¹⁰ This general observation rules out any other interpretation for (5a) other than the one given in (5).

- (6) a. What did the popstars at the party last night wear?
 b. ??Female popstars wore kaftans.
 c. The female popstars wore kaftans.
 (7) a. What did the popstars in those days wear?
 b. Female popstars wore kaftans.
 c. The female popstars wore kaftans.

2.2 *Subject indefinites*

With subject indefinites, the facts are a little more complicated. Japanese has morphological topic marking for subjects, which disambiguates indefinite

⁹ Example (1b) has a representation structurally similar to (5) if a phonologically null adverbial quantifier brings about the generic interpretation.

¹⁰ Topic-marked cardinal indefinites, however, allow a partitive interpretation — one where the quantifier is restricted to members of a group that is familiar from the discourse — even when not in the scope of an adverbial (Büring 1996; see also section 2.3).

subjects in cases where they are ambiguous in German. For example, the German sentence in (8a) allows both a generic and an existential interpretation for its subject, but the Japanese sentences (8b) and (8c) aren't ambiguous in the same way.¹¹ Example (8b) is judged true if there was a report that ten percent of the samurai seen in Tokyo station were noisy, but false in a situation where we don't know whether there still are any samurai but we know from books that being noisy is a characteristic property of samurai. The judgments for (8c) are the reverse, whereas the German (8a) is true in both situations.

- (8) a. weil Ritter laut sind (generic, existential)
because knights noisy are
b. Samurai-ga urusai (*generic, existential)
Samurai_{NOM} noisy
c. Samurai-wa urusai (generic, *existential)
Samurai_{TOP} noisy

A *wa*-marked subject always has only the generic interpretation (Brockett 1990). It is not true, however, that a *ga*-marked subject never allows a generic interpretation. Example (9) shows that a *ga*-marked subject occurring with an individual-level predicate allows only a generic interpretation.

- (9) Samurai-ga kasikoi (generic, *existential)
Samurai_{NOM} smart

Therefore, the absence of the generic interpretation in (8b) cannot be explained as a semantic contribution of the *ga* morpheme. Because the German example (8a) permits a generic interpretation, I assume that the availability of visible topic marking in Japanese makes the generic interpretation impossible in (8b). This insight is expressed by the following, probably pragmatic, principle: A phrase cannot be a topic if it's possible to mark it as such morphologically and it can also be interpreted as something other than a topic.

Now, let us look at examples with scrambling again. The pairs in (10) and (11) illustrate the effect of scrambling in German. As (10) shows, the position of the subject relative to a locative has a semantic effect in German.¹² The contrast in (11) is similar to examples given by Diesing (1992a:31) and shows that the position of the subject relative to *ja doch* also has an effect on interpretation.

¹¹ In Japanese, verbs come obligatorily with aspectual morphology that marks them as either habitual or progressive. Because the verbal morphology makes it hard to detect different interpretations of the subject, I use adjectival predicates that don't use such morphology.

¹² Example (10b) also allows attachment of the locative to the subject NP. The judgment in (10b) is for VP or IP attachment of the locative. An anonymous reviewer points out that the claim that (10b) involves scrambling is controversial, but agrees that there is a difference in interpretation between (10a) and (10b).

- (10) a. weil in Köln Ritter laut sind (generic,¹³ existential)
because in Cologne knights noisy are
b. weil Ritter_{t1} in Köln t₁ laut sind (generic, *existential)
because knights in Cologne noisy are
- (11) a. weil ja doch Studenten höflich waren (?generic, existential)
because indeed students polite were
b. weil Studenten₁ ja doch t₁ höflich sind (generic, *existential)
because students indeed polite were

The Japanese examples in (12) and (13) correspond to the German ones in (10) and (11) as closely as possible. Because the subject isn't morphologically marked as a topic in (12a) and (13a), only the existential interpretation is possible, as argued above. In (12b) and (13b), we see that scrambling again doesn't affect interpretation.¹⁴

- (12) a. Edo-de samurai-ga urusai (*generic, existential)
Edo-in samurai_{NOM} noisy
b. Samurai-ga₁ Edo-de t₁ urusai (*generic, existential)
Samurai_{NOM} Edo-in noisy
- (13) a. Naruhodo gakusei-ga shinsetsu datta (*generic, existential)
indeed students polite were
b. Gakusei-ga naruhodo shinsetsu datta (#generic, existential)
students_{NOM} indeed polite were

2.3 Cardinals: Scrambling versus quantifier float

The data discussed in this section show that Japanese scrambling has no noticeable effect on interpretation, not only as compared to German scrambling, but also as compared to another construction in Japanese — namely, a certain type of quantifier float. The relevant interpretive difference is the one between the purely cardinal and the partitive interpretation of a cardinal noun phrase. In German, as illustrated in (14), scrambling affects the possible interpretations (Diesing 1992a:78–79): The unscrambled example (14a) allows either a partitive interpretation (presuppositional) or a cardinal interpretation (nonpresuppositional) for the direct object. Scrambling of the direct object to the left of the indirect object in (14b) or to the left of the

¹³ In Diesing 1992a, subjects following an adverbial are judged not to allow a generic interpretation at all. But, so far, no German speaker I consulted shares this judgment. Also, Diesing (1992b:370) points out that a subject following an adverbial allows the generic interpretation if it isn't focused.

¹⁴ In a preliminary version of this paper (Sauerland 1996), I assumed that (12b) allows a generic reading. Based solely on this datum, I argued for a modification of the implementation of interpretability. Since then, I have consulted with four more Japanese speakers and learned that a generic reading isn't available. In Korean as well, examples like (12b) don't allow a generic reading (Yoon-jung Kang, personal communication). Possibly, my original informant confused *ga* and *wa* in (10b) but not in (10a) because *wa* is preferred in the sentence-initial position.

subject in (14c) makes the cardinal interpretation impossible. This is evidenced by the judgment that (14b) and (14c) are infelicitous in a situation where only three books were not sold and John gave all three to Mary, whereas they are true in a situation where six books were not sold and John gave three of them to Mary.

- (14) a. daß John Mary drei unverkaufte Bücher gegeben hat
that John Mary three unsold books given has
'John gave Mary three (of the) unsold books.'
(partitive, cardinal)
- b. daß John [drei unverkaufte Bücher]₁ Mary *t*₁ gegeben hat
that John three unsold books Mary given has
(partitive, *cardinal)
- c. daß [drei unverkaufte Bücher]₁ John Mary *t*₁ gegeben hat
that three unsold books John Mary given has
(partitive, *cardinal)

In Japanese, on the other hand, there is no difference between (15a), (15b), and (15c) (which are translations of (14)) with respect to the availability of the cardinal interpretation (adopted from similar examples of Ishii (1997:100)). This absence of a contrast seems to confirm again that Japanese scrambling doesn't have the semantic effect of German scrambling.¹⁵

- (15) a. John-wa Mary-ni [urenokotta hon-o san-satu] ageta
John_{TOP} Mary_{DAT} left-unsold books_{ACC} three-CL gave
'John gave Mary three (of the) unsold books.'
(partitive, cardinal)
- b. John-wa [urenokotta hon-o san-satu]₁ Mary-ni *t*₁ ageta
John_{TOP} left-unsold books_{ACC} three-CL Mary_{DAT} gave
(partitive, cardinal)
- c. [Urenokotta hon-o san-satu]₁ John-wa Mary-ni *t*₁ ageta
left-unsold books_{ACC} three-CL John_{TOP} Mary_{DAT} gave
(partitive, cardinal)

Surprisingly though, in (16), where the quantifier *san-satu* is separated from the associated noun *urenokotta hon-o*, a semantic effect similar to German scrambling is found — only the partitive interpretation is available in (16) (Ishii 1997).¹⁶ I assume with Miyagawa (1989) that (16) involves scrambling of the noun phrase *urenokotta hon-o*, stranding the cardinal quantifier *san-satu* in the base position of the direct object.

¹⁵ It has been claimed that examples like (15b), where the direct object precedes the indirect object, don't involve scrambling in Japanese (Miyagawa 1996, 1997). But, Yatsushiro (1998) shows that examples like (15b) can only be derived by scrambling.

¹⁶ Kitagawa and Kuroda (1992:appendix A) first observe this effect of quantifier float in passives.

(16) (Ishii 1997:(20b))

John-wa [urenokotta hon-o]₁ Mary-ni [*t*₁ san-satu] ageta
 John_{TOP} left-unsold books_{ACC} Mary_{DAT} three-CL gave
 (partitive, *cardinal)

Example (16) shows that Japanese speakers in principle are sensitive to the distinction between a partitive and cardinal interpretation, and hence, (14) and (15) are evidence of a significant difference between Japanese and German. In the remainder of this section, I present an account of the semantic effect of scrambling that strands a quantifier, as in (16).¹⁷

Ishii (1997:98) points out that quantifier float doesn't disambiguate between the two interpretations if the scrambling involved targets a position to the left of the subject.

(17) [Urenokotta hon-o]₁ John-wa Mary-ni [*t*₁ san-satu] ageta
 left unsold books_{ACC} John_{TOP} Mary_{DAT} three-CL gave
 (partitive, cardinal)

I claim that the difference between (17) and (16) relates to the possibility of reconstruction. It is known that scrambling to a position between subject and (indirect) object cannot reconstruct to its underlying position for the binding of a reciprocal (Tada 1990, Saito 1992), as shown in (18). Whereas the indirect object can bind the direct object in the unscrambled (18a), binding is impossible in (18b), where the direct object was scrambled to a position between the subject and the indirect object.¹⁸ Scrambling to a position to the left of the subject as in (18c), however, allows binding.

- (18) a. John-ga [Hanako-to Mary-ni]₁ otagai₁-o syookaisita.
 John_{NOM} Hanako-and Mary_{DAT} each other_{ACC} introduced
 'John introduced Hanako and Mary to each other.'
 b. *John-ga otagai₁-o₂ [Hanako-to Mary-ni]₁ *t*₂ syookaisita
 John_{NOM} each other_{ACC} Hanako-and Mary_{DAT} introduced
 c. Otagai₁-o₂ John-ga [Hanako-to Mary-ni]₁ *t*₂ syookaisita
 each other_{ACC} John_{NOM} Hanako-and Mary_{DAT} introduced

¹⁷ Ishii (1997) proposes to explain (16) as an effect of scrambling similar to that in German. But, (14) and (15) show a clear difference between German and Japanese, which Ishii only partially accounts for.

¹⁸ Miyagawa (1997:11) claims that (i) is marginally possible but only with the manner adverbial *isoide* present and focal stress on *otagai-no tomodati-o*. Many of my informants don't agree with Miyagawa's judgment, and I have been unable to determine whether the same factors make the cardinal interpretation available in (16) as my analysis would predict.

- (i) ?John-ga [otagai₁-no tomodati]-o₂ isoide [Hanako-to Mary-ni]₁ *t*₂ syookaisita
 John_{NOM} each other_{GEN} friends_{ACC} quickly Hanako-and Mary_{DAT} introduced
 'John introduced each other's friends to Hanako and Mary quickly.'

Further evidence that reconstruction to the position of the quantifier is required for the cardinal interpretation comes from an interaction with Condition C of the binding theory. In (19a), the cardinal reading should be possible because the movement stranding the quantifier is scrambling to the left of the subject. However, if *kanozyo* and *Mary* receive a coreferent interpretation, reconstruction is blocked in (19a) by Condition C. Therefore the cardinal interpretation is predicted to be possible in (19a) only if *kanozyo* is not interpreted as coreferent with *Mary*. This prediction is borne out, and (19a) contrasts in this respect with (19b), where the quantifier is not stranded in the underlying position of the object.

- (19) a. [Mary-ga₂ sukina hon-o]₁ John-wa kanozyo-ni₂ [*t*₁ san-satu]
 Mary_{NOM} likes books_{ACC} John_{TOP} her_{DAT} three-CL
 ageta
 gave
 ‘John gave Mary three of the books she liked.’
 (partitive, *cardinal)
- b. [Mary-ga₂ sukina hon-o san-satu]₁ John-wa kanozyo-ni₂ *t*₁
 Mary_{NOM} likes books_{ACC} three-CL John_{NOM} her_{DAT}
 ageta
 gave
 (partitive, cardinal)

The generalization governing the Japanese quantifier-float construction that I argue for is the following: If after reconstruction, the noun phrase is not in the same position as the associated numeral quantifier, only a partitive reading is possible. This generalization follows from the type economy principle of Beck (1996). Beck’s principle states that the type of a trace must always be the least complex one of those that allow a structure to be interpreted (i.e., combinable with the type of the sister of the trace and compatible with the type of the binder). For a partitive interpretation, the type of the sister of the quantifier can be that of individuals *e* as in *three of them* where *them* refers to a plural individual. For a cardinal interpretation, on the other hand, the type of the sister of the quantifier must be that of a common noun, $\langle e, t \rangle$, the type of first-order properties. For example, in *three books*, *books* must be of type $\langle e, t \rangle$. Of these two, Beck’s principle chooses the simpler one, which is the type of individuals *e*, for the trace. Because this forces the partitive interpretation, the generalization is predicted.

2.4 Scrambling of *wh*-phrases

Another argument for a difference in the semantic effect of scrambling between German and Japanese concerns the scrambling of *wh*-phrases. In

German, scrambling of *wh*-phrases is in many cases ungrammatical, as first pointed out by Engel (1972).¹⁹

In an unmarked context, example (20a), where the *wh*-phrase is scrambled to the left of the subject, is awkward compared to (20b), where the *wh*-phrase remains in situ.²⁰ Example (20a) is, however, quite good in a context that supports D-linking in the sense of Pesetsky (1989).²¹

- (20) a. ??Wer hat gesagt, daß wen₁ die Maria t₁ mag?
 who has said that who the Mary likes
 b. Wer hat gesagt, daß die Maria wen mag?
 who has said that the Mary who likes
 ‘Who said that Mary likes whom?’

In Japanese, on the other hand, scrambling of *wh*-phrases is fully grammatical, as shown in (21). Saito (1992) shows that *wh*-phrases can be scrambled even to a position above the +*wh* complementizer, as in (21b) (from Saito 1992:84).

- (21) a. Dare-ga dare-o₁ Mary-ga t₁ aisiteru to itta ka?
 who_{NOM} who_{ACC} Mary_{NOM} loves that said Q
 ‘Who said that Mary loves whom?’
 b. ?[Dono hon-o]₁ Masao-ga [Hanako-ga t₁ tosyokan-kara
 which book_{ACC} Masao_{NOM} Hanako_{NOM} library-from
 karidasita ka] siritagatteiru.
 checked-out Q want-to-know
 ‘Masao wants to know which book Hanako checked out from the library.’

The markedness of scrambling of *wh*-phrases in German follows, I assume, from a semantic incompatibility between the topic and *wh*-feature.

¹⁹ An anonymous reviewer reminds me that scrambling of bare indefinites is also often ungrammatical. This is illustrated for *was*, which is homophonous to a *wh*-word, in (ia) and *jemanden* in (ib). If this restriction is linked to the topichood of the scrambled object, the test done in the text could also be made by looking at bare indefinites in Japanese.

- (i) a. *daß wen₁ die Maria t₁ mag
 that someone the Mary likes
 b. *daß jemanden₁ die Maria t₁ mag
 that someone the Mary likes

²⁰ Scrambling of *wh*-phrases seems to improve, though, when the landing site is to the immediate left of an operator (quantifier or *wh*-phrase) (Beck 1996, Fanselow 1997). In my judgment, however, it is still not perfect in an unmarked discourse context.

²¹ In Müller and Sternefeld 1993, examples of *wh*-scrambling are ruled out at LF by an independently motivated syntactic principle: the Principle of Unambiguous Binding. For Japanese, they assume that this principle applies only at S-structure but not at LF. If D-linked phrases are assumed not to move, Müller and Sternefeld’s proposal predicts the same empirical generalization as the proposal in the text.

This also explains that even examples like (20a) become acceptable in German if the *wh*-phrases *wer* and *wen* are D-linked. Namely, D-linked phrases are partial topics in the sense of Büring (1996) because they refer to members of a group mentioned in the previous discourse. If this explanation of the German facts is on the right track, the fact that scrambling of *wh*-phrases is possible in Japanese indicates that scrambling in Japanese doesn't have the semantic effect of topicality.

3. Visibility of Checked Features in the Syntax: Surfing Paths

The parameterized semantic content together with Chomsky's (1995) interpretability proposal makes the following prediction: The Japanese scrambling feature should be invisible to the syntax after it has checked once, whereas the German one should remain visible after scrambling. The syntactic condition I will use to test for the syntactic visibility of a checked feature is Relativized Minimality, or rather its descendant, Shortest Attract.²² What we want to look for then is the following case: movement across an intervening checked feature, if it's driven by the same feature, should only be possible if this feature is uninterpretable. Such a derivation leads to an output that has two overlapping movement paths: one path that causes the intervening checked feature and another one created by the movement crossing this intervener.

There are four distinct cases where two movement paths overlap. The first two are nesting and crossing paths, shown schematically in (22), where left-to-right ordering indicates hierarchical order.

(22)



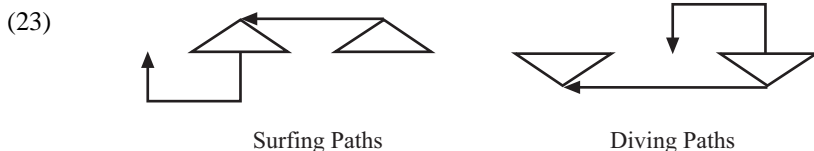
Nesting Paths

Crossing Paths

With crossing and nesting paths, the starting position of one chain c-commands the other. In the other two cases of overlapping paths, the starting position of one chain dominates that of the other. So, these cases involve a sub- and a superphrase with the subphrase moving out of the superphrase. I use the terms *surfing paths* and *diving paths* as shown in (23) to refer to such path patterns. Surfing paths are created by first moving the superphrase and then moving a

²² Another possible test might be the possibility of successive cyclic movement. Only an interpretable feature should allow the multiple attraction presumably necessary for successive cyclic movement. But, I argue in section 3.2 that the Japanese scrambling feature can in fact be assigned multiply to the same phrase and that this makes successive cyclic movement possible independent of the question of interpretability.

subphrase out of the superphrase and further up. Diving paths, on the other hand, are created by first moving a subphrase out of the superphrase and then moving the superphrase across the landing site of the subphrase.²³



All four of these path patterns are illustrated in (24) with *wh*-movement in English ((24a) and (24b) are from Pesetsky 1982). We see that nesting paths in (24a) are much better than crossing paths in (24b) but still slightly marked. Similarly, surfing paths in (24c) are better than diving paths in (24d) but also slightly marked (Saito 1989:187).

- (24) a. ?What subject₁ do you know who₂ to talk to t₂ about t₁? (nesting)
 b. *Who₂ do you know what subject₁ to talk to t₂ about t₁? (crossing)
 c. ?[What student]₁ did Ann ask [what picture of t₁]₂ to put up t₂?
 (surfing)
 d. *[What picture of t₁]₂ did Ann ask [what student]₁ to put up t₂?
 (diving)

3.1 Path patterns and economy

The contrasts between nesting versus crossing movement on the one hand and surfing versus diving movement on the other have received a considerable amount of attention in the literature. Pesetsky (1982) is to my knowledge the first who proposes that the same condition governs both paths' configurations. I, however, adopt an explanation of the contrasts in (24) based on a concept of economy, which to the best of my knowledge was first proposed by Takano (1992, 1994),²⁴ couched here in the terminology of Chomsky (1995). The two conditions crucial for Takano's explanation of both contrasts are Shortest Move/Attract (Fanselow 1991, Murasugi 1992, Chomsky 1995) and the cycle. I assume the formulation of these conditions given in (25).

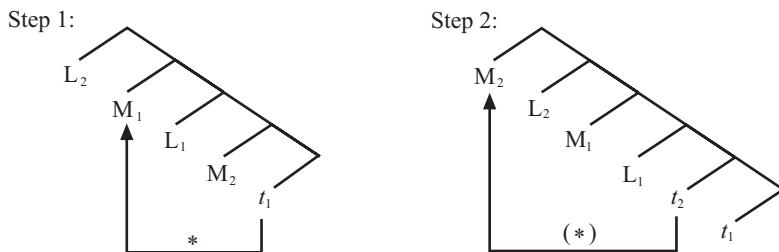
²³ Despite many previous discussions of these paths' patterns there are no established terms for them. May (1977) invokes surfing paths in his analysis of *inverse linking*. Discussion of diving paths has often revolved around the *Proper Binding Condition* (Fiengo 1977, May 1977, Saito 1989, Lasnik & Saito 1992). Müller (1998) uses the term *remnant movement* for diving paths.

²⁴ See also Kitahara 1994, 1997, Koizumi 1995, Müller 1996, 1998, and Oka 1996 for similar ideas but using different formulations. The formulation given here is closest to Müller 1998 and Kitahara 1997. Müller 1998 is also the most comprehensive exposition of the economy approach to overlapping paths' patterns.

- (25) a. **Shortest Attract:** *X attracts Y*, if *Y* is the closest phrase that can satisfy a requirement of *X*.²⁵
- b. **Cycle:** If *X* is c-commanded or dominated by *Y*, the strong requirements of *X* must be satisfied before the strong requirements of *Y*.²⁶

To see how these two conditions rule out crossing paths, look at the schematic derivations in (26) and (27). The two landing sites²⁷ for movement are L_1 and L_2 , and the two phrases marked for movement are M_1 and M_2 , where M_1 c-commands M_2 . To generate the crossing-paths pattern, M_1 has to end up in L_1 and M_2 in L_2 . Because of the cycle, movement to L_1 must take place before movement to L_2 takes place. Therefore, the derivation sketched in (26) — namely, first moving M_1 to L_1 and then moving the M_2 to L_2 — is the only derivation for crossing paths consistent with the cycle. But, the first step of (26) — attraction of M_1 by L_1 — definitely violates Shortest Attract because M_2 is closer to L_1 than M_1 at this point of the derivation. This explains the strong ill-formedness of crossing paths. Notice that the second step of the derivation — attraction of M_2 by L_2 — constitutes another violation of Shortest Attract if M_1 is still marked by a feature as a moving phrase at this point because then M_1 would be closer to L_2 .

(26) Cyclic derivation of crossing paths



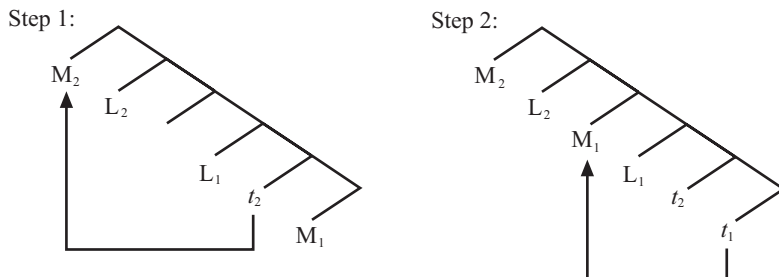
²⁵ The definition of *closest to X*, I assume, is such that *Y* is not closest to *X* if there is a *Z* that either c-commands or dominates *Y* and *Z* could move to *X*. I have no evidence bearing on the question of which of two phrases can be attracted when no c-command or domination relation holds between the two phrases. In section 3.2, I will add a statement of equidistance to the notion of closeness.

²⁶ Strong requirements of a head or phrase are those that must be satisfied by overt movement (Chomsky 1995). Richards (1997) provides empirical evidence for this particular statement of the cycle; in particular, evidence for the corollary that movement into projections of the same head is not subject to the cycle.

²⁷ It is immaterial for the following discussion what the precise nature of a landing site is. The only relevant property of landing sites here is that they require that a moving item must enter into a local relationship with the landing site.

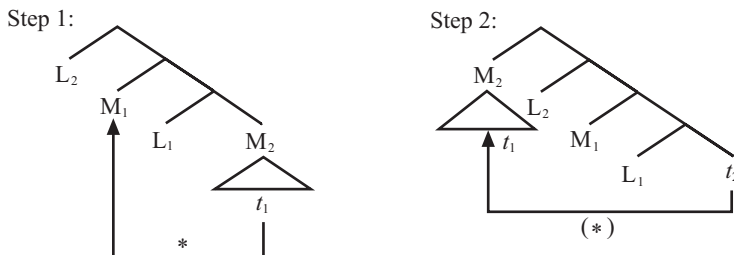
The derivation in (27) shows that a derivation of crossing paths would be possible if countercyclic movement was admitted. Therefore, the cycle is important for the economy-based approach to overlapping paths' patterns.

(27) Countercyclic derivation of crossing paths



The ungrammaticality of diving paths is explained in a similar manner to that of crossing paths, the only difference being that movement of M_1 violates Shortest Attract because M_2 dominates it rather than c-commands it. This is illustrated in the derivation in (28).²⁸

(28) Derivation of diving paths

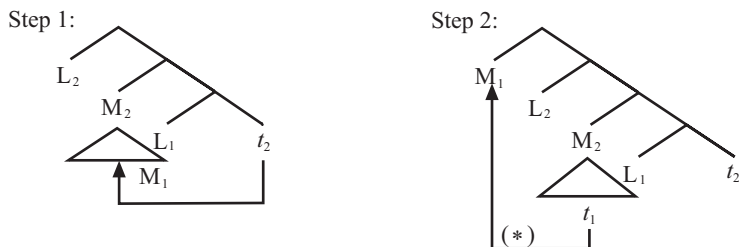


In (29), a derivation for surfing paths is sketched. The initial configuration is the same as that for diving paths, but for surfing paths, M_1 has to end up in L_2 and M_2 in L_1 . Again, the cycle forces movement to L_1 to take place before movement to L_2 . This time, the first step — attraction of M_2 by L_1 — in (29) satisfies the Shortest Attract condition because M_2 is closer to L_1 than M_1 is. The second step of the derivation — attraction of M_1 by L_2 — only satisfies Shortest Attract if M_2

²⁸ Notice that the cycle is not quite as important to ruling out diving paths. Namely, the conceivable countercyclic derivations of diving paths involve either countercyclic Merger or movement that violates the c-command condition. Although attempts have been made to subsume these cases of countercyclic movement under the cycle as presented here (Chomsky 1995), it still seems plausible that these are ruled out by independent conditions. The countercyclic derivation for crossing paths in (27), in contrast, violates only the cycle for movement.

is not marked for movement anymore at this point of the derivation. But if M_2 still bears the feature that was checked by attraction to L_1 , the second step of (29) violates Shortest Attract because M_2 is closer to L_2 than M_1 is.

(29) Derivation of surfing paths



The derivation of nesting paths is completely analogous to (29), except that M_1 is c-commanded rather than dominated by M_2 in the initial configuration. Therefore, surfing paths and nesting paths violate Shortest Attract if and only if the feature marking the moving phrase is still accessible for attraction after having been checked once. In effect, surfing and nesting paths can serve as a test for whether a feature erases after checking, which is the syntactic effect we expect interpretability to show.

For *wh*-movement in English, example (24) shows that surfing and nesting movements are slightly marked, whereas diving and crossing movements are completely ungrammatical. If we assume that the feature of *wh*-words that is checked by *wh*-movement is interpretable, diving and crossing movements each give rise to two violations of Shortest Attract, whereas surfing and nesting movements each cause only one such violation. Kitahara (1994) suggests that one violation of Shortest Attract (he uses the name Minimal Link Condition) causes a slight markedness, whereas two violations cause complete ungrammaticality. However, I show in section 4 that even one violation of Shortest Attract causes strong ungrammaticality — namely, when diving movement is driven by an uninterpretable feature. Therefore, I suggest that the reason that surfing and nesting paths are only slightly ill-formed is that the feature causing the violation of Shortest Attract in the derivation in (29) is already checked. This assumption is stated in (30):

- (30) Violations of Shortest Attract where a checked but still accessible feature is crossed cause a smaller degree of markedness than violations where an unchecked feature is intervening.

3.2 Nesting scrambling

Now consider scrambling. Nesting scrambling should be a test for the visibility of checked scrambling features. The result, however, seems to

falsify interpretability: (31a) and (31b) show that nesting paths are grammatical in Japanese and German, respectively.²⁹

- (31) a. Miyoko-o₂ (kinoo) Kazuko-ni₁ Haruka-ga t₁ [t₂
Miyoko_{ACC} yesterday Kazuko_{DAT} Haruka_{NOM}
tanoshimaseruto] yakusokusita.
entertain promise
'Haruka promised Kazuko (yesterday) to entertain Miyoko.'
- b. ?daß [die Susi]₂ gestern [dem Jonathan]₁ der Danny [_{CP} t₁ [_{CP} t₂
that the Susi yesterday the Jonathan the Danny
zu unterhalten] zu versprechen] versucht hat
to entertain to promise tried has
'that Danny tried yesterday to promise Jonathan to entertain Susi'

However, there's good reason to doubt that nesting paths are really a test for interpretability in the case of scrambling: Whereas crossing *wh*-movement paths were completely ungrammatical, crossing scrambling paths are fully grammatical in both German and Japanese. This is illustrated in (32a) and (32b).

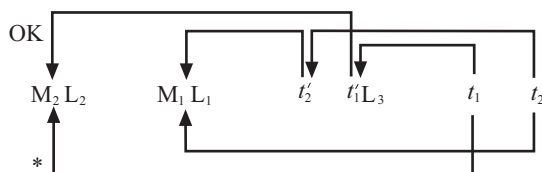
- (32) a. Kazuko-ni₁ (kinoo) Miyoko-o₂ Haruka-ga t₁ [t₂
Kazuko_{DAT} yesterday Miyoko_{ACC} Haruka_{NOM}
tanoshimaseruto yakusokusita.
entertain promised
'Haruka promised Kazuko (yesterday) to entertain Miyoko.'
- b. ?daß [dem Jonathan]₁ gestern [die Susi]₂ der Danny [_{CP} t₁ [_{CP} t₂
that the Jonathan yesterday the Susi the Danny
zu unterhalten] zu versprechen] versucht hat
to entertain to promise tried has
'that Danny tried yesterday to promise Jonathan to entertain Susi'

In this respect, scrambling is similar to *wh*-movement in languages like Hebrew, Bulgarian, and Romanian, where both crossing and nesting paths are possible. Reinhart (1981), Rudin (1988), Koizumi (1994), and Richards (1997) offer an explanation for the possibility of crossing and nesting movements in multiple *wh*-movement languages of the Bulgarian type. In the terminology of this paper, their result is that the possibility of multiple specifiers can obviate the effect of economy because they are equidistant for attraction from a higher position, so either one can be attracted. This allows,

²⁹ My informants found example (31a) difficult to parse when the adverb *kinoo* is present. But, when *kinoo* is left out, (31a) is fully acceptable, which suffices to make the point here. Also, (31b) is marked for many speakers presumably since *versprechen* only marginally allows scrambling out of its infinitival complement (Wurmbrand 1996). What is relevant here is that there's no contrast between nesting in (31b) and crossing in (32b).

for example, the derivation sketched in (33), where the two moving items both move into specifiers of an intermediate landing site L_3 and thereby become equidistant.

(33) Derivation of crossing paths with multiple specifiers



This derivation, however, explains the possibility of crossing and nesting scrambling as well. The understanding of scrambling I have assumed is one where the scrambling feature can be optionally added to mark phrases as either landing sites or moving items. Under this view, nothing prevents the addition of a second scrambling feature in any position. If we also assume that each application of movement can only check one feature of the landing site and one of the moving category, then adding a second scrambling feature in a landing site will force two phrases to scramble into the specifier domain of this category. Because this renders the two scrambling phrases equidistant, it follows that both nesting and crossing scrambling will be fully grammatical.

3.3 Surfing scrambling

The other test for interpretability is surfing scrambling. In section 2, I argued that Japanese scrambling is uninterpretable, whereas German scrambling is interpretable. If the syntactic visibility of a checked feature is linked to its interpretability, as Chomsky (1995) suggests, then surfing scrambling should be possible in Japanese but not in German. As observed by Grewendorf and Sabel (1994) and shown in (34) and (35), these predictions are borne out for each language. In Japanese, surfing-scrambling paths are fully grammatical in both (34a) and (34b). In (34a), the superphrase that undergoes scrambling is a tenseless complement clause. Extraction out of such a clause has been shown by Nemoto (1993, 1995) to have properties of A-movement. Therefore, presumably, (34a) has two chains of A-movement in a surfing pattern. In (34b), on the other hand, only the first operation of scrambling could potentially have A-properties. The second one must be long-distance scrambling of the type that Saito (1989) argues to be semantically vacuous A-bar movement because a finite clause boundary is crossed.

- (34) a. Booru-o₁ matigatte [Susi-ni t₁ watasoo to]₂ Kazuko-ga t₂
 ball_{ACC} falsely [Susi_{DAT} to-give that Kazuko_{NOM}
 kokoromita.
 tried
 ‘Kazuko tried to give a ball to Susi by mistake.’
- b. Kazuko-o₁ Daiko-ga [Ayumi-ga t₁ hometa to]₂ Masa-ga t₂
 Kazuko_{ACC} Daiko_{NOM} Ayumi_{NOM} praised that Masa_{NOM}
 itta to itta.
 said that said
 ‘Daiko said that Masa said that Ayumi praised Kazuko.’

The German examples in (35a) and (35b) support the claim that surfing scrambling in German is always ill-formed. Example (35a) is the direct counterpart of the Japanese example (34a), and (35b) shows that scrambling out of a nominal phrase, which is sometimes possible when the nominal phrase is in situ, becomes impossible when the nominal phrase is scrambled. Notice that in (35a) the adverb *vergeblich* cannot be part of the infinitival clause because the resulting interpretation would be deviant.³⁰

- (35) a. *?weil [den Ball]₁ vergeblich [der Susi t₁ zu geben]
 because the ball unsuccessfully the Susi to give
 die Kazuko t₂ versucht hat
 the Kazuko tried has
- b. *?weil gestern [von Chomsky]₁ in Frankfurt [das
 because yesterday of Chomsky in Frankfurt the
 neue Buch t₁]₂ niemand t₂ gekauft hat
 new book nobody bought has

So, the predicted difference between Japanese and German is empirically confirmed. In the following section, I argue that this prediction is a real achievement by showing that the present account of the contrast makes a prediction that two conceivable alternative accounts of the contrast between (34) and (35) don't make.

³⁰ Example (i) shows that scrambling of the subphrase is possible in examples like (35) where the superphrase hasn't been scrambled. And, (ii) shows that the superphrase can scramble as long as the subphrase doesn't scramble as well. Hence, the ungrammaticality of (35) must be due to the surfing configuration.

- (i) a. weil [den Ball]₁ vergeblich die Kazuko [der Susi t₁ zu geben] versucht hat
 because the ball unsuccessfully the Kazuko the Susi to give tried has
- b. weil gestern [von Chomsky]₁ in Frankfurt niemand [das neue Buch t₁]₂ gekauft hat
 because yesterday of Chomsky in Frankfurt nobody the new book bought has
- (ii) a. weil vergeblich [der Susi [den Ball]₁ zu geben] die Kazuko t₂ versucht hat
 because unsuccessfully the Susi the ball to give the Kazuko tried has
- b. weil gestern in Frankfurt [das neue Buch [von Chomsky]₁]₂ niemand t₂
 because yesterday in Frankfurt the new book of Chomsky nobody
 gekauft hat
 bought has

4. Further Predictions

As shown above, the interpretability proposal correctly predicts the grammaticality of surfing scrambling paths from the presence or absence of the semantic content of scrambling. If there is no alternative explanation for the contrast with respect to surfing paths, this result constitutes real empirical support for the interpretability proposal. In this section, I show that the interpretability approach makes two further correct predictions that set it apart from all obvious alternative explanations for the contrast seen with surfing movement.

Two elements of the interpretability approach make further predictions, both of which are related to the way in which Shortest Attract applies. The assumption that surfing scrambling in German is blocked by Shortest Attract makes a prediction because Shortest Attract only affects movements where the same feature intervenes. Therefore, we expect that in cases where different features drive the two movements, surfing paths will be possible even in German. A difference between different types of surfing paths isn't predicted by an account of the ungrammaticality of surfing scrambling paths in German based solely on a condition that blocks extraction from a scrambled phrase, such as the proposal by Diesing (1992a:118–120). For the second prediction, recall that in Japanese Shortest Attract is obviated in the case of surfing movement because the checked scrambling feature can be erased. This predicts that the Minimal Link Condition shouldn't be obviated even with Japanese scrambling in cases where the higher scrambling feature hasn't been checked yet. This is the case of diving scrambling paths, and I show that these are indeed ungrammatical in both German and Japanese. If it wasn't for this prediction, the possibility of surfing paths in Japanese could be due to the existence of two different scrambling features in Japanese, or one might assume following Fukui (1993) and Fukui and Saito (1998) that scrambling is not checking any feature. But this assumption would predict both surfing and diving scrambling paths to be equally grammatical. I now show that in both cases — that of mixed surfing paths in German and that of diving scrambling paths in Japanese — the prediction of my proposal is borne out.

4.1 *Mixed paths*

The first prediction is that surfing paths should be good even in German if the two movements involved are driven by different features. In fact, all overlapping path patterns are predicted to be good if the movements involved are driven by different features. The reason is that different features don't incur violations of Shortest Attract. Takano (1994) and Müller (1993) present evidence showing that this is a desirable property of the Shortest Attract condition³¹ by demonstrating that diving paths are often good when the two

³¹ Takano (1993), in fact, points out the significance of his data for the formulation of the Shortest Move/Attract condition. Müller 1993 develops the same empirical generalization as Takano, but only Müller 1996, 1998 adopts the economy-based account.

movements involved belong to different types but never when the two movements involved belong to the same type. For example, a diving pattern created by a scrambling path and an operator path is grammatical in German as shown in (36).³²

- (36) [t_1 Mit einem Besen zu putzen]₂ hat Danny das Bad₁
 with a broom to clean has Danny the bathroom
 vergeblich t_2 versucht.
 unsuccessfully tried
 ‘Danny tried unsuccessfully to clean the bathroom with a broom.’

For surfing paths, one possible mixed pattern — scrambling out of a *wh*-movement phrase — is independently ruled out by the clause-boundedness of German scrambling. But, the other mixed pattern is possible. Haider (1993:161) and Grewendorf and Sabel (1994:293) claim that *wh*-extraction out of scrambled phrases is fully grammatical in German. Although I and most native speakers I talked to don’t find such examples perfect, they clearly contrast with surfing scrambling paths, as illustrated in (37). The residual markedness in (36b) is possibly related to the factors discussed by Diesing (1992a).

- (37) a. *?daß [das Bad] der Danny [t_1 zu putzen]₂ gestern t_2
 that the bathroom the Danny to clean yesterday
 begonnen hat
 began has
 b. ?[Das Bad]₁ hat der Danny [t_1 zu putzen]₂
 the bathroom has the Danny to clean
 gestern t_2 begonnen.
 yesterday began
 ‘Danny began yesterday to clean the bathroom.’

The contrast in (37) argues that, even in German, movement out of scrambled phrases isn’t uniformly bad, contrary to what Diesing (1992a) assumes, but there are differences in its acceptability.

Grewendorf and Sabel (1996), in a sense, modify Diesing’s condition and propose that all movement out of a scrambled phrase is blocked, but only if the scrambled phrase occupies an A-bar position. Assuming that scrambling

³² In Japanese, as well, a scrambling path and a *wh*-movement path in a diving pattern are grammatical (Kurafuji 1995), as expected if Japanese has overt *wh*-movement (Takahashi 1993). Other cases of mixed diving paths supporting the Takano-Müller generalization are *wh*- and NP-movement paths in English and scrambling and cliticization in German (Müller 1998:227).

- (i) a. [t_1 Donnani utukusiku]₂ sono biyoosi-wa Mary-o₁ t_2 sita no?
 how beautiful the cosmetician Mary made Q
 ‘How beautiful did the cosmetician make Mary?’
 b. * [t_1 utukusiku]₂ biyoosi-ga Mary-o₁ t_2 sita.
 beautiful cosmetician_{NOM} Mary_{ACC} made

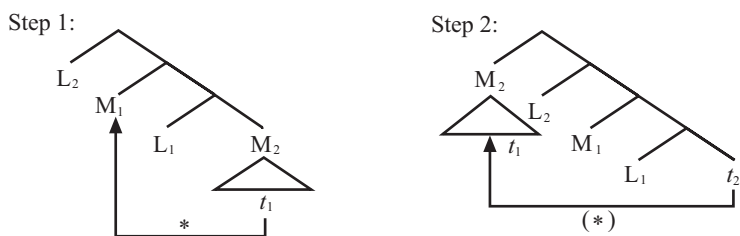
to the left of the subject is movement to an A-position in Japanese, but an A-bar position in German, the proposal accounts for the differences between German and Japanese noted in section 3.3. However, the contrast in (38) shows that surfing scrambling paths are ungrammatical in German, even when A-scrambling is involved.

- (38) a. *?weil [über Colorado]₁ nur Susi [ein Buch t₁]₂
 because about Colorado only Susi a book
 dem Jonathan t₂ geschenkt hat
 the Jonathan given has
- b. weil [über Colorado]₁ nur Susi dem Jonathan ein Buch t₁
 because about Colorado only Susi the Jonathan a book
 geschenkt hat
 given has

4.2 Diving scrambling paths

The second prediction is that even the Japanese scrambling feature should be visible for Shortest Attract before it is checked. The path pattern that tests this prediction is diving paths, the derivation of which is sketched again below (repeated from (28)). Because of the cycle, the subphrase M₁ first moves out of the superphrase M₂ before M₂ itself undergoes movement to check its scrambling feature. Because the scrambling feature on M₂ is unchecked when M₁ is moved across it, we expect that even in Japanese this movement will violate Shortest Attract.

(39) Derivation of diving paths



Example (40) from Saito (1992) shows that the prediction is borne out: Diving scrambling is ungrammatical in Japanese.

- (40) *[Hanako-ga t₁ yonda to]₂ [sono hon-o]₁ Taroo-ga t₂ itta.
 Hanako_{NOM} read that that book_{ACC} Taroo_{NOM} said

For German, we also expect diving scrambling to be ill-formed, and this is illustrated in (41a). In fact, diving scrambling is still worse than surfing

scrambling shown in (41b), as expected, because surfing paths involve only crossing over a checked feature, whereas diving paths involve crossing over an unchecked feature.

- (41) a. *Danny hat [t_1 zu putzen] $_2$ vergeblich [das Bad] $_1$
 Danny has to clean unsuccessfully the bathroom
 gestern t_2 versucht.
 yesterday tried
- b. *?Danny hat [das Bad] $_1$ vergeblich [t_1 zu putzen] $_2$
 Danny has the bathroom unsuccessfully to clean
 gestern t_2 versucht.
 yesterday tried

The argument mentioned in the introduction that scrambling is feature-driven is based on the observation that diving paths are bad. Takano (1992, 1994), Kitahara (1994, 1997:77–82), and Müller (1996:301–324, 1998:271–293) show that this assumption accounts for the ungrammaticality of (40) and (41a) in terms of Shortest Attract, as sketched here, and make the right prediction about the grammaticality of examples with diving paths across a number of cases.

The fact that diving scrambling paths are bad also argues that scrambling is driven by only one feature in both Japanese and German. That is, if movement of M_1 above was driven by a different feature than the one M_2 bears, no blocking is expected. This was seen to be the case with mixed diving paths in the previous section. Oka (1996) shows that in Japanese diving scrambling is bad, regardless of whether the movements involved have A or A-bar properties. As he notes, the Shortest Attract-based explanation of diving paths carries over to his cases only if all scrambling in Japanese is checking the same feature of the moving phrase.

5. Conclusions

In this paper, I have shown a correlation between two properties of scrambling: whether it has an effect on the interpretation of indefinites and whether the feature driving it must remain visible throughout the course of the syntactic computation. German scrambling is driven by a feature that has an effect on interpretation and that must remain visible in the syntactic derivation. Japanese scrambling is driven by a feature; one that doesn't have an effect on interpretation and that can disappear in the course of the syntactic derivation. Chomsky's (1995) interpretability proposal predicts the correlation between these two properties. Therefore, the result achieved here corroborates Chomsky's idea.

Perhaps the most surprising result of this paper is that Japanese scrambling doesn't affect interpretation even though the movement is optional. I have adopted this claim from Saito (1989), Tateishi (1994), and Fukui (1993) and have given some further empirical support for it in section 2. If the claim is

correct, it contradicts the intuition that optionality is always associated with a difference in meaning. This intuition seems to be based at least in part on what we know about synonyms. First, there are only very few true synonyms, and secondly, most speakers only use one word of a synonym pair actively, where the choice often depends on the social group of a speaker. This suggests that the language faculty is eager to postulate a difference in meaning to correlate with any kind of optionality, such that the optionality will be rendered apparent. However, it is not clear that the same holds for optional movements like extraposition in English. In fact, scrambling in Japanese, just like extraposition in English, might often be invoked for the ease of parsing. For example, Babyonyshev and Gibson (1995) show cases where unprocessable center-embedding sentences in Japanese become processable after scrambling has applied. Therefore, the apparent contradiction between noninterpretability and optionality might be resolvable.

5.1 A note on parameter setting

For the acquisition of the proposed interpretability parameter of the scrambling feature, the +interpretable setting of German must be the default because the –interpretable setting gives rise to a superset grammar. However, it seems doubtful that the learner of Japanese will have access to any of the data that I used here to deduce that Japanese differs from German: examples with scrambling of *wh*-in-situ or with surfing scrambling paths are probably rare in the input to the learner. At this point, I can only offer suggestions concerning this problem: It might be that more of the differences between German and Japanese scrambling might be determined by the interpretability parameter. In particular, the clause-boundedness of scrambling in German versus the greater freedom of Japanese (Saito 1992) might be related to interpretability. Saito (1992) argues that long-distance scrambling of the type that is impossible in German must obligatorily reconstruct in Japanese. If we assume that only movement driven by a –interpretable feature may totally reconstruct in Saito's sense, any example of long-distance scrambling would be positive evidence for the –interpretable setting of the interpretability parameter. An alternative idea might be to tie the interpretability parameter to other differences between German and Japanese — for example, the presence of morphological topic marking in Japanese or differences in intonational phonology.

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