Real-Time Computation of Japanese Exclamatives
and the Strength of Locality Biases in Sentence Comprehension

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Abstract

This paper investigates mechanisms of long-distance dependency formation in language comprehension, using experimental data on the processing of Japanese interrogatives and exclamatives to explore the nature of locality biases in parsing. Findings on the processing of exclamative wh-phrases are compared to previous results involving the processing of interrogative wh-phrases, revealing both similarities and differences. Experiment 1 uses a sentence fragment completion task with in-situ and fronted exclamative and interrogative wh-phrases. Both types of in-situ wh-phrase show a strong bias for local generation of licensing particles. Conditions with fronted wh-phrases show a contrast between interrogative and exclamative wh-phrases: interrogatives show a bias for interpretation in an embedded clause, replicating previous evidence for a long-distance scrambling bias in Japanese (Aoshima, Phillips, & Weinberg, 2004); in contrast, the long-distance scrambling bias is weaker for fronted exclamative wh-phrases. Experiment 2 uses an on-line self-paced reading task to investigate the processing consequences of expectations for a local licensor for in-situ exclamative wh-phrases. Results indicate processing disruption when readers fail to encounter a licensor for an exclamative wh-phrase at the first possible verb position, although the disruption is weaker than the Typing Mismatch Effect shown for interrogatives in previous studies by Miyamoto and Takahashi (2002). Different possible accounts of the parallels and contrasts between processing of interrogatives and exclamatives are discussed.

Keywords: syntactic dependencies, sentence processing, interrogatives, exclamatives, Japanese, Typing Mismatch Effects, reanalysis, locality

Running head: Processing Exclamatives

1.   Introduction

In this paper we are concerned with the process of long-distance dependency formation in sentence processing, using experimental data on Japanese interrogative and exclamative constructions. There has been much recent interest in long-distance dependency formation in recent psycholinguistic literature, with an increasingly cross-linguistic reach, and in this paper we aim to extend the contribution to this litereature of some distinctive properties of Japanese.

Much of the research in this literature has focused on understanding the nature and source of locality biases that have been observed in the comprehension of long-distance dependencies. For example, wh-questions in English typically involve the fronting of a wh-phrase, which may in principle occur an unbounded distance from the predicate that it is semantically associated with. Example (1) shows a case in which the wh-phrase (in psycholinguistic parlance the 'filler') and its canonical position (the 'gap', marked by underlining) are separated by eight words and a clause boundary.

(1)   Who does John believe that Mary ate dinner with ___ last Thursday?

Locality biases in the comprehension of so-called filler-gap dependencies appear in at least two forms. First, speakers judge longer dependencies as harder to understand than shorter dependencies (Gibson, 1998; Phillips, Kazanina, & Abada, 2005). Second, the parsing of sentences like (1) often presents opportunities for temporary mis-parses, due to uncertainty about the location of the gap. At the beginning of sentence (1) a reader or listener cannot know the semantic role of the wh-phrase *who* (2a), but may incorrectly guess that it is a main clause subject.. The appearance of the main clause subject *John* indicates that the wh-phrase is not the main clause subject, and when the first verb occurs, the comprehender may incorrectly assume that the wh-phrase is the object of *believe* (2b). A similar temporary mis-parse may arise at the embedded verb *ate* (2c), if the parser ignores the semantic cue that this is implausible, before the parser reaches the ultimately correct gap site.

(2)   a.   Who ___
       b.   Who does John believe ___
       c.   Who does John believe that Mary ate ___

It is now fairly well established that the parser does entertain temporarily incorrect gap sites during the processing of filler-gap dependencies. This shows that the parser 'actively' constructs filler-gap dependencies, without waiting for unambiguous confirmation of the gap site, and this has been understood as another reflex of a locality bias in dependency formation. Active construction of filler-gap dependencies in English wh-questions has been demonstrated using a variety of different measures, including the *Filled Gap Effect* in self-paced reading (Crain & Fodor, 1985; Stowe, 1986), implausibility detection measures using reading-times (Garnsey, Tanenhaus, & Chapman, 1989; Traxler & Pickering, 1996; Phillips, 2006) head-mounted eye-tracking (Sussman & Sedivy, 2003), and event-related brain potentials (ERPs: Garnsey et al., 1989; Kaan, Harris, Gibson, & Holcomb, 2000). For a recent review see Phillips & Wagers (in press).

Active construction of filler-gap dependencies in English wh-questions may, in principle, reflect a special-purpose subroutine of the English parser that is adapted to constructions that it encounters frequently, or it may reflect a more general architectural property of the parser. These alternatives can be distinguished by testing different types of long-distance syntactic dependencies and diverse languages. Japanese has proven to be particularly useful in this regard. First, it presents types of long-distance dependencies not found in English, thereby allowing us to test the generality of active dependency formation mechanisms. Second, the strongly head-final nature of Japanese syntax creates a dissociation between structural and linear distance that makes it possible to better understand the nature of locality biases.

Locality in Japanese I: the Typing Mismatch Effect

An important piece of evidence for the diversity of locality biases comes from a study by Miyamoto & Takahashi (2002) on Japanese in-situ wh-phrases. Whereas wh-phrases in English are typically fronted to a position where they mark the scope of the question, either as a direct question or an indirect question, wh-phrases in Japanese often appear in their canonical thematic position, and the scope of the question is indicated by the position of the interrogative particle or *Q-particle -ka* (or *-no* in main clauses), which appears as a suffix on the verb. Thus, in English the parser can readily identify the scope of a question but must search for a gap site that indicates the thematic role of the wh-phrase. In Japanese in-situ questions, in contrast, the parser can readily identify the thematic role of the wh-phrase but must search for a Q-particle in order to identify the scope of the question. Miyamoto & Takahashi show using sentences like (3) that after encountering an embedded clause in-situ wh-phrase Japanese readers are slower to read an embedded verb bearing a declarative complementizer (3b) than one bearing a Q-particle (3a), despite the fact that both sentences are fully acceptable. They interpret this as the result of a locality bias that makes the parser expect to find a Q-particle at the first possible position after the wh-phrase, and they dub the slowdown upon not encountering the Q-particle as the *Typing Mismatch Effect* (TME). Importantly, Miyamoto and Takahashi also showed that the reading time pattern at the embedded verb reversed in conditions that did not contain a wh-phrase.

(3) a. senmu-wa   kakarityoo-ga dono pasokon-o   tukatteiru-ka itta
         supervisor-TOP director-NOM   which computer-ACC   use-Q   said
         'The supervisor said which computer the manager uses.'
     b. senmu-wa   kakarityoo-ga dono pasokon-o   tukatteiru-to itta-no
         supervisor-TOP director-NOM   which computer-ACC   use-COMP   said-Q
         'Which computer did the supervisor say that the manager uses?'

In what follows, we investigate whether similar locality biases extend to Japanese exclamative constructions, which involve a different syntactic dependency.

Locality in Japanese II: the Long-Distance Scrambling Bias

Although the evidence from English, Japanese, and other languages clearly demonstrates a bias for local resolution of syntactic dependencies, it leaves open a number of possibilities about the motivation for the locality bias and about what the relevant notion of locality is. Some recent findings from Japanese by Aoshima and colleagues (Aoshima, Phillips, & Weinberg, 2004) provide clues to the answers to these questions.

The bias for local completion of wh-dependencies in English could reflect the parser's aim to minimize the distance between the wh-phrase and the gap (e.g., Frazier & Clifton, 1989; de Vincenzi, 1991), or it could reflect the aim of identifying the thematic role of the wh-phrase at the first possible opportunity (e.g., Pritchett, 1991; Gibson, Hickok, & Schütze, 1994; Boland, Tanenhaus, Garnsey, & Carlson, 1995). These accounts make similar predictions in English, but make divergent predictions in Japanese scrambling constructions. Although wh-phrases in Japanese typically appear in their thematic positions ('wh-in-situ'), they may also undergo fronting as a result of the process known as 'scrambling'. Like English wh-fronting this scrambling is potentially unbounded, but in contrast to English it has no impact upon the scope interpretation of the question. Consequently, sentences like (4), in which a dative wh-phrase is fronted to sentence-initial position, are globally ambiguous, such

that the wh-phrase may be interpreted in the main clause as an argument of the verb *iu* 'say' (4a) or in the embedded clause as an argument of the verb *ageru* 'give' (4b).

(4)   a.   Dare-ni John-wa ___ [Mary-ga ___ sono hon-o ageta-to] itta-no.
        b.   Dare-ni John-wa   [Mary-ga ___ sono hon-o ageta-to] itta-no.
                who-dat J.-top   M.-nom   that book-acc give-pst said-Q
        a'.   'Who did John tell that Mary gave that book to somebody?'
        b'.   'Who did John say that Mary gave that book to?'

Aoshima and colleagues show using three different experimental measures that Japanese speakers show a bias to interpret fronted dative wh-phrases like in (4) in the embedded clause rather than in the main clause. They first demonstrate this bias using the Typing Mismatch Effect paradigm of Miyamoto & Takahashi (2003), showing that after reading a fronted wh-phrase readers are more surprised to encounter a declarative complementizer than a Q-particle on the embedded clause verb. Experiment 2 below builds upon this finding. They then use an adaptation of the Filled Gap Effect reading paradigm to show that the fronted wh-phrase is interpreted in the embedded clause before the parser reaches the embedded verb. Finally, Aoshima and colleagues replicate the bias for long-distance scrambling interpretations using a simple sentence fragment completion task. When Japanese speakers were asked to complete sentence fragments like (5) containing a fronted wh-phrase in a pencil-and-paper task, most completions showed that the fronted phrase was interpreted in the embedded clause. Experiment 1 of the current study uses a closely related paradigm.

(5)   Dono sinnyuusei-ni   tannin-wa   sisyo-ga   tosyositu-de...
                which new student-dat   class teacher-top   librarian-nom library-at

Aoshima and colleagues argue that the bias to treat fronted wh-phrases as having undergone long-distance scrambling is only superficially the opposite of what has been observed in English and other head-initial languages. They argue that since the embedded verb is the first element in a Japanese sentence that can satisfy the thematic and scope-licensing requirements on the wh-phrase, the long-distance scrambling bias reflects the parser's objective of satisfying grammatical constraints at the earliest possible opportunity. This, in turn, implies that the parser does not treat gap creation as an end in itself, but rather that gap creation is driven by the need to satisfy grammatical constraints. In this way, a surprising finding about Japanese parsing lends support to widespread 'principle-based' or 'constraint-based' models of parsing.

A couple of important notes about these studies and follow-up studies by our group are particularly relevant to the current article.

First, the long-distance scrambling bias challenges one widespread view of how the parser updates representations as each new incoming word arrives. It is widely assumed that when the parser tries to incorporate each new word into the ongoing parse without giving up existing parsing commitments unless absolutely necessary. This assumption greatly constrains the parser's search space of possibilities at each new word, it is sometimes known as the *Reanalysis as a Last Resort* (RALR) constraint, and it has been supported by a number of recent experimental findings in English (Sturt, Pickering, Scheepers, & Crocker, 2001; Schneider & Phillips, 2001) and Japanese (Kamide & Mitchell, 1999). However, there is good reason to think that the embedded clause gaps that arise from the long-distance scrambling bias are not the parser's first choice of gap site. The Japanese parser cannot initially know that the sentence that it is processing has multiple clauses, and thus it may

initially posit a main clause gap that is subsequently reanalyzed when an embedded clause gap is created. Furthermore, Aoshima, Yoshida, & Phillips (submitted) present experimental evidence from the time-course of anaphor resolution that supports the notion that parser initially posits a gap in the same clause as the fronted wh-phrase. Importantly, in sentences like (4) no grammatical constraint *requires* that the parser reanalyze the gap from a main clause site to an embedded clause site, and thus this suggests that reanalysis is not always a last resort. This point will become relevant in the analysis of the current studies.

Second, follow-up studies led by Masaya Yoshida have shown that the mechanisms that give rise to the long-distance scrambling bias are sensitive to grammatical constraints on long-distance scrambling (Yoshida, 2006; Yoshida, Aoshima, & Phillips, in prep.). Using the Japanese Filled Gap Effect paradigm, Yoshida and colleagues show that the long-distance scrambling bias disappears in cases where long-distance scrambling would violate a grammatical island constraint, as in relative clause contexts, or would fail to allow local satisfaction of scope-licensing constraints, as in conditional clause contexts. Thus the bias for long-distance scrambling applies only when it is grammatically legal and grammatically profitable.

Third, in another follow-up study Aoshima and colleagues have suggested that the long-distance scrambling bias is restricted to cases of wh-scrambling and is not observed when referential NPs are scrambled (Aoshima, Yoshida, & Phillips, 2005). Based on this finding, they argue that the long-distance scrambling bias is specifically related to the search for grammatical licensing morphology, such as Q-particles, and is not driven exclusively by the need to satisfy the thematic requirements of the fronted phrase.

Taken together, findings from the processing of Japanese interrogative wh-phrases indicate a pervasive bias for local dependency completion, where locality is understood to be driven by grammatical constraint satisfaction and is measured in terms of temporal order rather than in terms of hierarchical distance. We now turn to a discussion of the exclamative wh-constructions that are the focus of the current study.

The Syntax of Japanese Exclamative Wh-Phrases

In contrast to interrogative wh-phrases, which have been extensively studied in English, Japanese, and many other languages, exclamative wh-phrases, as in Red Riding Hood's *Grandma, what a big mouth you have!* have received rather less attention. Although they show many parallels to interrogative wh-phrases, exclamative wh-phrases also exhibit some distinctive properties, which will be of particular interest in the current studies. Here we highlight the similarities and differences in the form of the wh-phrase and its licensors in interrogatives and exclamatives, and the similarities and differences in scrambling possibilities. For extensive discussion of the syntax of Japanese exlamatives see Ono (2006).

Whereas interrogative wh-phrases headed by *dono* 'which', *dare* 'who', and *nani* 'what' must be licensed by the Q-particles *-ka* or *-no* (6a), wh-phrases containing the exclamative expression *nante* must be licensed by the verbal suffix *-nodaroo* (6b).[1] In Ono (2006) the exclamative licensing particles are analyzed as a sequence of functional heads, but for purposes of this article it will suffice to treat *-nodaroo* as a single particle that is the syntactic head of an Exclamative Phrase projection. Also, we do not discuss in detail here the fact that the exclamative particle appears in varied forms and often undergoes morphological reduction, depending on the gender of the speaker and the register of the discourse, and focus

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[1] In Japanese, the famous exlamation by Red Riding Hood (*Aka-zukin-chan*) would be '*Obaasan, nante ookina okuchi desyoo!*.' The exclamative *nante* is here paired with *desyoo* rather than *na-nodaroo* because Red Riding Hood, of course, uses the polite form when addressing an elder.

on the 'standard' form *-nodaroo*. In certain circumstances speakers also generate the Q-particle *-ka* in addition to *-nodaroo*, yielding *-nodarooka*.

(6)   a.   John-wa   [dono   ookina   piza]-o   tabemasita-ka
                John-TOP   which   big   pizza-ACC   ate-Q
                'Which big pizza did John eat?'

        b.   John-wa   [nante   ookina   piza]-o   tabeta-nodaroo
                John-TOP   WH-EXC big   pizza-ACC   ate-EXC
                'What a big pizza John ate!'

Just as interrogative wh-phrases need not appear in the same clause as the licensing particle and may be licensed by Q-particles in a higher clause, as in (7), so exclamative wh-phrases may also be licensed by *-nodaroo* appearing in a higher clause (8).

(7)   Mary-wa [John-ga   dono ookina piza-o tabeta]-to   omoimasita-ka
                Mary-TOP John-NOM which big   pizza-ACC   ate-COMP   thought-Q
                'Which big pizza did Mary think that John ate?'

(8)   Mary-wa [John-ga   nante ookina piza-o   tabeta]-to omotta-nodaroo
                Mary-TOP John-NOM wh-EXC big   pizza-ACC   ate-COMP thought-EXC
                'What a big pizza Mary thought that John ate!'

However, although there is a broad parallelism between interrogative and exclamative licensing particles, some evidence suggests that they are structurally non-parallel. The interrogative Q-particle *-ka* is often analyzed as a realization of the complementizer head, an overt realization of the Q-morpheme proposed in Katz & Postal (1964) and much later work. Consistent with this, the Q-particle generally appears in complementary distribution with the regular complementizer *-to*. When embedded under verbs that select an interrogative complement, such as *siritagaru* 'wonder', the embedded verb must bear the Q-particle *-ka* and cannot be marked with *-to* (9a). Under verbs that can embed quotations, such as *kiku* 'ask' *-ka* and *-to* may cooccur, although *-to* is optional (9b). In contrast, in embedded exclamative complements that contain *-nodaroo* the complementizer *-to* is obligatory, and cannot be omitted (10). Ono (2006) argues that this difference follows from the status of *-ka* as a complementizer head, whereas *-nodaroo* heads an independent syntactic phrase. These alternative structures are shown schematically in Figure 1.

(9)   a.   Mary-wa [John-ga   dono ookina piza-o   tabeta]-ka-(*to) siritagatteita
                Mary-TOP John-NOM which big   pizza-ACC   ate-Q-COMP   wondered
                'Mary wondered which big pizza John ate.
        b.   Mary-wa [John-ga   dono ookina piza-o   tabeta]-ka-(to)   kiita
                Mary-TOP John-NOM which big   pizza-ACC   ate-Q-COMP   asked
                'Mary asked which big pizza John ate.

(10)   Mary-wa [John-ga   nante   ookina piza-o tabeta]-nodaroo-*(to) omotta
               Mary-TOP John-NOM wh-EXC big   pizza-ACC   ate-EXC-COMP thought
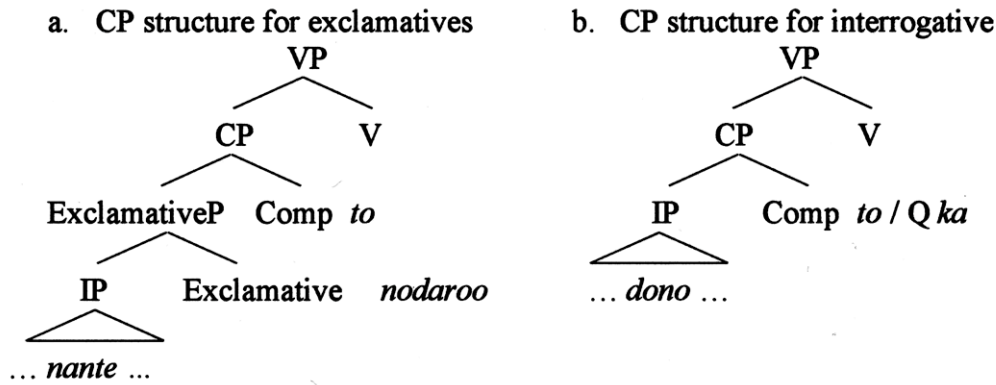   'Mary thought, "What a big pizza John ate!" '

a. CP structure for exclamatives   b. CP structure for interrogative

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        a. CP structure for exclamatives                    b. CP structure for interrogative
                    VP                                                   VP
                   /  \                                                 /  \
                 CP    V                                              CP    V
                /  \                                                 /  \
     ExclamativeP  Comp to                                         IP   Comp to / Q ka
           /  \                                                   /\
         IP   Exclamative nodaroo                            ... dono ...
        /\
   ... nante ...
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Figure 1. Schematic illustrations of the structural position of licensing particles for (a) exclamative and (b) interrogative wh-phrases.

We also find both similarities and differences among interrogative and exclamative wh-constructions when we consider their scrambling possibilities.

First, exclamative constructions follow a similar constraint to interrogatives such that the licensing particle -*nodaroo* must appear at least as high in the structure as the thematic position of the *nante*-phrase, i.e., it must c-command *nante*. This constraint is illustrated in the contrast between (11a) and (11b), and it mirrors a well-known constraint on the distribution of Q-particles in interrogative constructions (Harada, 1972).

(11) a.   nante   takusan-no hito-ga   [sono gakusee-ga mondai-o   toita-to]
             wh-EXC many-GEN man-NOM that   student-NOM problem-ACC solve-COMP
             omotta-nodaroo
             thought-EXC
             'What a lot of people thought that the student solved the problem!'
     b.   * nante   takusan-no hito-ga   [sono gakusee-ga mondai-o toita-nodaroo-to]
             wh-EXC many-GEN man-NOM that student-NOM problem-ACC solve-EXC-COMP
             omotta
             thought

Evidence from scrambling confirms that the constraint on the relative structural position of wh-phrases and their licensors applies to the thematic positions of the wh-phrase rather than to surface positions. Saito (1989) shows that an interrogative phrase can undergo long-distance scrambling to a position that it outside the c-command domain of the Q-particle (12). Similar possibilities are available for exclamative wh-phrases, as shown by the unscrambled sentence in (13a) and its scrambled counterpart in (13b).

(12) a.   dono hon-o   John-wa [Mary-ga tosyokan-kara ___ karita-ka] siritagatteiru
             which book-ACC J-TOP   M-NOM library-from   borrowed-Q wonder
             'John wonders which book Mary borrowed from the library.

(13) a.   John-wa [Mary-ga [nante   takusan-no gakusee]-ni A-o
             J-TOP   M-NOM   wh-EXC many-GEN student-DAT A-ACC
             ageta-nodaroo-to] akireteita
             gave-EXC-COMP   amazed
             'John was amazed at what a lot of students Mary gave an A to.'

b.   [nante   takusan-no gakusee]-ni John-wa [Mary-ga ___ A-o
          wh-EXC many-GEN student-DAT J-TOP   M-NOM   A-ACC
          ageta-nodaroo-to]   akireteita
          gave-EXC-COMP   amazed

Importantly for current purposes, long-distance scrambling of exclamative wh-phrases is constrained by the type of predicate that embeds the exclamative construction. The examples in (13) show an exclamative construction embedded under the emotive predicate *akireteiru* 'be amazed'. For predicates of this type the semantics of the exclamative construction is related to the semantics of the embedding predicate. Interrogative wh-phrases are often understood to denote a variable that ranges over a set of possible values that a variable could take in an answer to the question. Exclamative wh-phrases, in contrast, indicate that the actual value of the variable is unexpectedly extreme. Since the predicate *akireteiru* 'be amazed' indicates that its complement conveys an unexpected proposition, it bears a close semantic relation to the exclamative construction. In contrast, many predicates that select clausal complements do not entail such a close semantic relation to the exclamative construction. (14) is an example of this. When exclamative constructions are embedded under these predicates, long-distance scrambling is significantly degraded in acceptability. This restriction may be related to the fact that when *-nodaroo* is embedded under a neutral predicate the exclamative construction is typically understood as a quotation, and quotations are islands for scrambling.

(14)   a.   Taroo-wa [Hanako-ga nante   ookina ringo-o tabeta-nodaroo-to] hookoku-sita.
          T-TOP   H-NOM   wh-EXC big   apple-ACC ate- EXC-COMP   reported.
    b.   ??[nante   ookina ringo]-o Taroo-wa Hanako-ga tabeta-nodaroo-to hookoku-sita.
         wh-EXC big   apple-ACC T-TOP   H-NOM   ate- EXC-COMP   reported.
         'Taroo reported what a big apple Hanako ate.'

In sum, despite many similarities between interrogative and exclamative wh-phrases, there are two syntactic differences that are particularly relevant for the studies that follow. First, the licensing particle *-nodaroo* appears to be the head of an independent functional projection below the complementizer position where interrogative *-ka* appears. Second, although long-distance scrambling of exclamative wh-phrases out of an exclamative clause marked by *–nodaroo* is possible, this is restricted to environments where the exclamative clause is embedded under an emotive predicate that directly licenses the exclamative semantics.

In what follows we take advantage of the similarities and differences between interrogative and exclamative wh-constructions to further explore the nature of locality biases in processing long-distance dependencies. Experiment 1 uses a sentence fragment completion paradigm to investigate the processing of in-situ and fronted exclamative wh-phrases. This allows for a detailed analysis of the expectations that speakers generate when they process pre-verbal material, but provides little information about the detailed time-course of processing. Experiment 2 focuses on more fine-grained timing information by using a self-paced reading study to investigate the processing of in-situ exclamatives, using a version of the Typing Mismatch Paradigm of Miyamoto & Takahashi (2002).

2.   Experiment 1: Sentence Completion Task

An off-line sentence fragment completion task was designed as an initial test of locality biases in the processing of exclamative constructions. The study was modeled on

Experiment 3 of Aoshima et al. (2004). The first aim of this study was to investigate whether speakers prefer to license embedded in-situ exclamative wh-phrases in the embedded clause or in the main clause. Both options are fully acceptable, but embedded clause licensing creates a more local dependency. If processing of exclamative wh-phrases parallels the processing of interrogative wh-phrases, then we expect a strong local licensing bias. The second aim of this study was to investigate whether fronted exclamative wh-phrases show the same long-distance scrambling bias previously observed for interrogative wh-phrases. Aoshima and colleagues found that in fragments with fronted dative wh-phrases around two-thirds of completions treated the fronted phrase as having undergone scrambling from the embedded clause, and they interpreted this as further evidence for a bias to associate a fronted wh-phrase with the first available predicate in a sentence. In this study we wanted to test whether the same bias extends to exclamative constructions.

2.1   Procedures

Forty-two undergraduate native speakers of Japanese participated in the experiment. Experimental materials consisted of thirty sets of sentence fragments with six conditions each (see Appendix A for a complete list of items). The thirty sets of items were distributed among six lists in a Latin Square design. Each participant saw exactly one of the lists intermixed with 60 unrelated fillers in a random order.[2] Target items consisted of three NPs, each marked by a different case marker (topic, nominative, dative). The four experimental conditions discussed here followed a 2 x 2 factorial design, manipulating the factors *wh-type* (interrogative vs. exclamative) and *word order* (in-situ vs. fronted wh-phrase). A sample set of items is illustrated in (15).

(15)　a.　　Exclamative / In situ
　　　　　　sono sensee-wa　　　gakusee-ga　　　nante takusan-no onnanoko-ni ...
　　　　　　that teacher-TOP　　　student-NOM　　wh-EXC many-GEN girl-DAT
　　　b.　　Exclamative / Fronted
　　　　　　nante takusann-no onnanoko-ni　　　sono sensee-wa　　　gakusee-ga ...
　　　　　　wh-EXC many-GEN girl-DAT　　　　　that teacher-TOP　　　student-NOM
　　　c.　　Interrogative / In Situ
　　　　　　sono sensee-wa　　　gakusee-ga　　dono onnanoko-ni ...
　　　　　　that teacher-TOP　　　student-NOM　which girl-DAT
　　　d.　　Interrogative / Fronted
　　　　　　dono onnanoko-ni　　sono sensee-wa　　　gakusee-ga ...
　　　　　　which girl-DAT　　　that teacher-TOP　　　student-NOM

All fragments contained two subject NPs, one bearing the topic marker *-wa* and the other bearing the nominative marker *-ga*. Previous studies have shown that a sequence of these two case particles provides a strong cue for a bi-clausal structure (Miyamoto, 2002; Aoshima et al., 2004). In the exclamative conditions a dative-marked exclamative wh-phrase appeared together with an adjective and a head noun. The adjective was included in order to provide a property for the exclamative *nante* to modify. In the interrogative conditions a two-word *which*-N NP was used, also in the dative case. In the in-situ conditions the wh-phrase appeared after the embedded clause subject, and in the fronting conditions the wh-phrase

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[2] Two of the six conditions included the bare exclamative phrase *nante* without additional adjectives or a head noun as in the other conditions. Unfortunately, participants frequently misparsed this word as a part of the adjacent NP, interpreting it as the colloquial wh-expression that is used to mean 'what name of N'. For this reason, we do not consider these two conditions further in this paper.

appeared as the first phrase in the fragment. The wh-phrases were marked with dative case, because this increased the ambiguity regarding the location of the gap associated with the wh-phrase. Nominative NPs cannot be scrambled in Japanese, and scrambled accusative-marked NPs show limited ambiguity in multi-clause structures, since no verb in Japanese can select both an accusative NP and a complement clause. In contrast, a scrambled dative NP could easily be understood as a main clause or as an embedded clause argument.

We expected that participants would complete the sentence fragments by supplying at least two predicates. Although there are, in principle, predicates that can take a sequence of arguments marked with topic, nominative and dative markers, previous experience suggests that Japanese speakers choose the bi-clausal option far more often. In addition, participants needed to provide an appropriate licensing particle (exclamative or interrogative) for the wh-phrase. All participants gave informed consent and were paid for their participation, which lasted about 45 min.

2.2 Results

Results from 9 of 42 participants were excluded because 25% or more of the target fragments were not completed. Among the remaining 33 participants a further 8 incomplete trials were excluded, leaving a total of 652 fragment completions for further analysis. In order to determine how speakers resolved the syntactic dependencies involving the interrogative and exclamative wh-phrases, we analyzed the distribution of licensing particles, the argument structure properties of the embedded clause predicates, and the semantic properties of the main clause predicates.

Table 1 shows the distribution of licensing particles across the four experimental conditions. The overwhelming majority of fragment completions yielded grammatical sentences containing two clauses and two predicates and a licensing particle for the wh-phrase. The most common types of ungrammatical responses involved either a missing licensing particle or a missing predicate. There were greater numbers of ungrammatical completions in the exclamative conditions, particularly the fronted exclamative condition, suggesting that these conditions were more difficult to process.

Conditions	Licensing Particle						Ungram.
	Embedded Clause		Main Clause		Both		
	N	*%*	*N*	*%*	*N*	*%*	
Interrogative in-situ	159	98.1	3	1.9	0	0	2
Exclamative in-situ	151	98.7	2	1.3	0	0	12
Interrogative fronting	33	21.1	114	73.1	9	5.8	6
Exclamative fronting	25	20.3	96	78.0	2	1.6	38

Table 1. Experiment 1, distribution of the licensing particles *-ka* (interrogative) and *-nodaroo* (exclamative) in off-line sentence fragment completions.

There was a clear difference in the distribution of licensing particles between conditions. In both in-situ conditions the licensing particle appeared on the embedded clause verb in around 98% of completions, indicating an equally strong local licensing bias in the interrogative and exclamative conditions alike. Fisher Exact tests confirmed that there was no reliable difference between two in-situ conditions ($p > .40$, 2-tailed). In the conditions with fronted wh-phrases only around 20% of completions contained an embedded clause licensing particle, and around three-quarters of completions contained main clause licensing particles. Again, there was little difference between the interrogative and exclamative conditions. Fisher Exact tests confirmed that there was no reliable difference between the rates of

embedded clause licensing particles in the two fronting conditions ($p > .40$, 2-tailed), but that the difference between in-situ and fronting conditions was highly reliable ($p < .001$, 2-tailed).

A note is in order on the form of the licensing particle used in the different conditions. In the interrogative conditions speakers consistently used the licensing particle *-ka*, as expected. However, there was more variability in the form of the licensing particles used with exclamative phrases. In the in-situ exclamative conditions, 62% (94/151) completions contained the licensing particle *-ka* rather than *-noda*, and in slightly over half of those cases *-ka* was followed by the particle *-to*. The *-kato* combination was especially frequent in completions that contained an exclamative clause embedded under a predicate that is semantically associated with exclamatives, such as *odoroku* 'be surprised'. Although it is possible that these completions with *-ka* reflect trials on which the participants mistakenly read the fragments as containing interrogatives, it is just as likely that these reflect the diversity of forms of the exclamative licensing particle.

Although the number of embedded clause licensing particles is greatly reduced in the two fronting conditions, it would be premature to conclude from this that the fronted wh-phrases were rarely interpreted as embedded clause arguments. This is because it is fully acceptable for an embedded clause wh-phrase to be associated with a main clause licensing particle, as shown by the examples in (7-8). As discussed by Aoshima et al. (2004) additional clues to where a fronted phrase is interpreted can be found in the argument structure of the predicates used in the sentence fragment completions. If a fronted dative wh-phrase is interpreted as an embedded clause argument, then we expect to find embedded clause predicates in the fragment completions that select dative-marked arguments. Therefore, a better estimate of the number of embedded clause interpretations of fronted wh-phrases can be gained by combining information on particle placement and argument structure.

Table 2 shows the distribution of dative-taking verbs in the embedded and main clauses in trials where the licensing particle was marked on the main clause verb. This analysis showed that there were many trials where the licensing particle was marked on the main clause verb and the embedded clause verb selected a dative argument. Importantly, there were roughly twice as many such trials in the interrogative fronting condition than in the exclamative fronting condition. A Fisher Exact test showed that this difference was reliable ($p < .001$, 2-tailed).

Conditions	Embedded obligatory		Embedded optional		Main only	
	N	%	*N*	%	*N*	%
Interrogative fronting	23	20.2	25	21.9	66	57.9
Exclamative fronting	17	17.7	5	5.2	74	77.1
Total	40		30		140	

Table 2. Experiment 1, fronting conditions: counts and percentages of verbs that select a dative-marked argument in completions with main clause licensing particles.

Taking together the data in Tables 1 and 2 we can create a composite estimate of the number of embedded clause interpretations in each condition, by adding the number of completions in which the licensing particle occurred in the embedded clause to the number of completions with a main clause licensing particle and an embedded clause predicate that selects a dative argument. 15 trials with the embedded clause particle *-ka* from the exclamative fronting conditions were excluded from this analysis because of uncertainty about whether participants interpreted the fragment appropriately, as discussed above. The composite estimates are shown in Table 3.

	Embedded	
	N	*%*
Interrogative in-situ	162	100
Exclamative in-situ	153	100
Interrogative fronting	90	57.7
Exclamative fronting	34	31.5

Table 3. Experiment 1, composite estimate of the number and percentage of completions in which the wh-phrase was interpreted in the embedded clause.

It is important to recognize that for the fronting conditions the figures in Table 3 are only estimates, since they depend on the assumption that speakers generate embedded dative-taking verbs only when they intend to interpret the fronted wh-phrase in the embedded clause. This assumption is likely a little too strong. Nevertheless, it is striking that many more trials were consistent with embedded clause interpretations of the fronted wh-phrase in the interrogative fronting condition than in the exclamative fronting condition.

In an effort to better understand the source of the difference between the two fronting conditions, we also conducted an analysis of the main clause verbs generated in the fragment completions. This was relevant in light of the fact that long-distance scrambling out of exclamative constructions is more readily available when the embedding predicate is semantically associated with the exclamative, as shown in (13-14) above. Emotive predicates are particularly compatible with exclamative complements. This analysis revealed that in the exclamative in-situ conditions emotive predicates accounted for close to 40% of main clause predicates, whereas in the exclamative fronting conditions emotive predicates accounted for only around 15% of the main clause predicates. The possible implications of this contrast are discussed below.

2.3   Discussion

Sentence fragment completion data provides information about the preferred interpretation of sentence-initial material, although it does not provide detailed information about the time-course of sentence processing. The aim of Experiment 1 was to investigate whether the processing of in-situ and fronted exclamative wh-phrases in Japanese exhibits the same locality biases that have been observed for interrogative wh-phrases. The results were mixed. In the in-situ conditions, the parallel between the exclamative and interrogative conditions was striking: in both conditions there was a very strong bias to generate structures in which the wh-phrase formed a local dependency with an embedded clause licensing particle. The embedded clause interrogative particles indicated indirect questions; the embedded clause exclamative particles indicated embedded exclamative constructions. Although both of these are fully grammatical constructions, we have no evidence that the embedded clause licensors are more frequent than main clause licensors in naturalistic Japanese. Relevant to the interrogative conditions, Lieberman, Aoshima, & Phillips (2006) conducted a preliminary analysis of on-line Japanese texts to find instances of multi-clause constructions containing a wh-phrase. They found that only around a third of examples were indirect questions, in sharp contrast to the almost exceptionless bias to generate indirect questions in the in-situ conditions here and in other studies. Relevant to the exclamative conditions, speakers report that main clause licensing of exclamatives is fully natural, and that embedded exclamative clauses under non-emotive predicates tend to be interpreted as reported speech. In sum, the in-situ conditions extend to exclamative constructions previous evidence for a local bias in generating licensing particles for wh-phrases (Miyamoto & Takahashi, 2002; Aoshima et al., 2004).

The results from the conditions with fronted wh-phrases show less parallelism between interrogative and exclamative conditions. Based on a combination of evidence from the position of Q-particles and the argument structure of embedded verbs we estimated that in 57.7% of interrogative trials the fronted dative wh-phrase was interpreted in the embedded clause. This is similar to the results for similar conditions in Aoshima et al. (2004, Table 9), who found a 61% rate of embedded clause interpretations. On the other hand, the results from our exclamative fronted conditions suggested that the fronted exclamative wh-phrase was interpreted in the embedded clause in only 31.5% of trials. Therefore, the interrogative conditions replicate the evidence for a bias for long-distance scrambling interpretations previously found by Aoshima et al. (2004), but the evidence for this bias is rather weaker in the exclamative conditions.

Following Aoshima et al. (2004) we assume that the long-distance scrambling bias in the interrogative conditions is motivated by the parser's need to satisfy either thematic or scope-licensing requirements on the wh-phrase at the first possible opportunity. However, such a general constraint satisfaction account begs the question of why fewer long-distance scrambling analyses are pursued in the exclamative fronting condition than in the interrogative fronting condition. Although we cannot offer a single definitive answer here, we can highlight some possible reasons for the contrast, to which we will return in the General Discussion.

The first possible reason for the weaker long-distance scrambling bias in the exclamative conditions involves the acceptability of long-distance scrambling of exclamative wh-phrases. If long-distance scrambling of exclamatives is considered less acceptable than long-distance scrambling of interrogatives, this may have led participants to consider this analysis of the fronted phrase on fewer trials. It is possibly noteworthy in this regard that Japanese speakers find long-distance scrambling of an exclamative degraded in contexts where the exclamative licensing particles are embedded under non-emotive verbs. Our analyses of the main clause predicates used in the fragment completions showed that in the exclamative fronting condition very few emotive predicates appeared in the main clause. If we assume that in a fragment completion task speakers choose the main clause predicate before committing to the form of the embedded clause, then this would imply that by choosing a main clause non-emotive predicate speakers effectively blocked the possibility of licensing the exclamative wh-phrase in the embedded clause.

An alternative possible reason for the drop in long-distance scrambling interpretations in the exclamative conditions involves the syntactic and semantic implications of marking a clause as an exclamative using the particle *-nodaroo* or one of its variants. Recall that Aoshima et al. (2004) argued that the long-distance scrambling analyses of fronted wh-phrases are not the parser's first analysis, but rather that the parser first considers a local scrambling analysis, before it receives evidence that it is dealing with a multi-clause structure. This implies that the parser carries out unforced reanalysis in its zeal to locally satisfy the requirements of the fronted phrase. As argued in detail in Ono (2006), this reanalysis may be the source of the difference between interrogative and exclamative constructions. If the Q-particle in interrogative constructions is a realization of a complementizer head, then reanalysis of interrogative constructions should never require creation or destruction of functional head positions, only re-typing of an obligatory head as either declarative or interrogative. On the other hand, the exclamative licensing particle is the head of an independent syntactic projection, then reanalysis of exclamative constructions is potentially more destructive, requiring creation or removal of syntactic heads. This may be sufficient to reduce the likelihood of reanalysis from an initial local scrambling analysis.

Experiment 1 showed that the processing of fronted interrogative and exclamative wh-phrases differ even in an off-line fragment completion task that provides little timing

information. In contrast, the off-line data suggested a parallel between the processing of in-situ interrogatives and exclamatives, with both creating a strong expectation for a local licensing particle. In Experiment 2 we turned to an on-line self-paced reading task, in order to provide a closer test of the similarity between interrogatives and exclamatives.

3. Experiment 2: Self-Paced Reading Task

The aim of this experiment was to use the Typing Mismatch Effect paradigm of Miyamoto & Takahashi (2002) to investigate whether in-situ exclamative wh-phrases show on-line evidence for a local licensing bias in an on-line setting. The results from the sentence fragment completion task in Experiment 1 suggested that after encountering an in-situ exclamative wh-phrase speakers prefer to encounter the licensing particle *-nodaroo* or one of its variants at the first possible verb position. In this study we investigated whether this expectation leads to increased processing difficulty in cases where the parser fails to encounter the particle on the local predicate.

3.1 Participants

Forty-three native speakers of Japanese participated in the experiment. All of them were students at Hiroshima University, Japan. They gave informed consent and received financial compensation for their participantion, which lasted around 20 minutes.

3.2 Materials and Design

The experimental materials consisted of twenty-four sets of sentences with four conditions each (see Appendix B for a complete list of experimental items). The twenty-four sets of items were distributed among four lists in a Latin Square design. Each participant saw exactly one of the lists intermixed with seventy-two fillers in a random order. The four conditions were organized in a 2 x 2 factorial design that manipulated the factors *argument-type* (exclamative vs. non-exclamative) and *complementizer type* (-noda-to or just -to at the embedded clause verb). An example set of experimental items is shown in (16).

(16)   sono kantoku-wa   nintaiduyoi   sensyu-ga …
        that   manager-TOP   patient   player-NOM …

   a.   Exclamative / *noda*
         … nante   ooku-no   fan-ni   hidoi   waruguti-o   itta-noda-to
         … wh-EXC   many-GEN fan-DAT   awful   word-ACC   said-EXC-COMP
         benti-no   ura-de   gakkarisi-teiru
         bench-GEN   behind-at   disappointed-ING
         'Behind the bench, that manager is disappointed about what a lot of fans the patient player swore at.'

   b.   Non-exclamative / *noda*
         … totemo ooku-no   fan-ni   hidoi   waruguti-o   itta-noda-to
         … very   many-GEN fan-DAT   awful   word-ACC   said-EXC-COMP
         benti-no   ura-de   gakkarisi-teiru
         bench-GEN   behind-at   disappointed-ING
         'Behind the bench, that manager is disappointed about the patient player swearing at a lot of fans.'

    c.   Exclamative / *to*

            … nante   ooku-no   fan-ni   hidoi   waruguti-o   it-teita-to

            … wh-EXC many-GEN fan-DAT   awful word-ACC   said-ING-COMP

            benti-no   ura-de   kantigaisita-noda

            bench-GEN   behind-at   misunderstood-EXC

            'Behind the bench, what a lot of fans the manager misunderstood that the patient player swore at!'

    d.   Non-exclamative / *to*

            … totemo ooku-no   fan-ni   hidoi   waruguti-o   it-teita-to

            … very   many-GEN fan-DAT   awful word-ACC   said-ING-COMP

            benti-no   ura-de   kantigaisi-teiru

            bench-GEN   behind-at   misunderstood-EXC

            'Behind the bench, that manager misunderstood that the patient player swore at a lot of fans.'

All conditions began with a sequence of two subject NPs that provided a cue for a bi-clausal structure. The next phrase was a dative-marked NP that was the critical exclamative or non-exclamative NP. The only difference between the exclamative and non-exclamative phrases was in the alternation between the exclamative modifier *nante* and the non-exclamative modifier *totemo* 'very'. In the *noda* conditions the exclamative licensing particle *-noda* appeared on the embedded verb, which is linearly the closest position to the *wh*-phrase. In the *to* conditions, on the other hand, the declarative complementizer *-to* appeared on the embedded verb and the exclamative particle *-noda* was delayed until the matrix verb position. Also in the *-to* conditions, the embedded verb appeared in the *-teiru* form, in order to more closely match the length of the embedded verb regions across conditions. The main clause predicate in sentence final position was always an emotive predicate, which freely allows embedding of an exclamative construction.

3.3   Procedure

The experiment was conducted on a Dell computer running the *linger* software for reading-time studies developed at MIT (Rohde, 2001-2003). Participants were timed in a self-paced non-cumulative moving-window reading task (Just, Carpenter, & Woolley, 1982). Most of the sentences appeared on a single line. The target items were segmented with spaces as shown in Table 4.

Region	1	2	3	4	5	6	7	8	9	10
Content	NP-TOP	Adj	NP-NOM	excl Adj NP-DAT very Adj NP-DAT	Adj	NP-ACC	V-EXC-COMP V-TEIRU-COMP	NP-GEN	NP-at	V V-noda

Table 4. Experiment 2, region segmentation in the self-paced reading task

Yes/no comprehension questions were presented after each trial, in order to ensure that the participants attended to the content of the sentences. All trials on which the comprehension question was answered incorrectly were excluded from further analysis. The experimental trials were preceded by instructions and three practice trials.

3.4   Results

Data from 4 of the 43 participants were excluded due to poor accuracy (< 70%) in the comprehension task. The overall comprehension accuracy for the target items among the

remaining participants was 83.3%. Two additional participants were excluded due to abnormally long reading times and one due to abnormally fast reading times. Two experimental items were excluded due to poor accuracy on the comprehension task (53% and 60%, respectively), plus one additional item that was judged to be pragmatic awkward. Reading times that exceeded a threshold of 3.5 standard deviations from the average for each region were eliminated, affecting 1.0% of the total data points. Results of the reading time analysis are shown in Table 5. Region 7 to 10 were the critical regions.

Conditions	Region							
	7 (embedded V)		8 (NP-GEN)		9 (PP)		10 (main V)	
	RT	s.e.	RT	s.e.	RT	s.e.	RT	s.e
Exclamative-*noda*	604	25	529	18	435	9	570	19
Exclamative-*to*	579	22	528	15	463	10	710	23
Non-exclamative-*noda*	593	23	514	16	448	11	608	20
Non-exclamative-*to*	589	24	534	16	462	11	684	21

Table 5. Experiment 3, reading times (ms) and standard errors per region

There were no significant differences between conditions prior to region 7. At the embedded verb in region 7 there was no main effect of NP-type ($Fs < 1$) or of complementizer type ($Fs < 1.2$). There were no significant differences among conditions at the genitive NP in region 8 (all $Fs < 1$).

At the prepositional phrase in region 9 there was a main effect of complementizer type that was marginally significant in the participants analysis and significant in the items analysis ($F_1(1,35) = 3.37$, $p < .08$; $F_2(1,20) = 6.43$, $p < .05$), due to longer reading times in the -*to* conditions than in the -*noda* conditions. There was no main effect of NP-type ($Fs < 1$), and no interaction of complementizer type and NP-type.. However, pairwise comparisons revealed that the effect of complementizer type was primarily due to the exclamative conditions. In the exclamative conditions the -*to* condition was read significantly more slowly than the -*noda* condition ($F_1(1,35) = 4.48$, $p < .05$; $F_2(1,20) = 9.88$, $p < .01$), but the same comparison for the non-exclamative conditions showed no significant difference ($Fs < 1.3$).

At the main verb in region 10 there was a main effect of complementizer type ($F_1(1,35) = 30.14$, $p < .01$; $F_2(1,20) = 19.20$, $p < .01$), due to longer reading times in the -*to* conditions, which had the particle -*noda* in this position. There was no main effect of NP-type ($Fs < 1$). The interaction of NP-type and complementizer type was marginally significant in the participants analysis but not in the items analysis ($F_1(1,35) = 3.52$, $p < .07$; $F_2(1,20) = 1.16$, $p > .25$).

3.5 Discussion

The goal of this experiment was to investigate whether the local licensing bias for exclamative wh-phrases that we observed in an off-line sentence completion task in Experiment 1 extends to on-line measures. In Experiment 1 we found that when an exclamative wh-phrase appears as an in-situ argument in an embedded clause speakers consistently generate continuations in which the licensing particle for the exclamative appears on the embedded clause verb, although a main clause licensing particle would be fully grammatical and natural. We suggested that this bias reflects the parser's goal of satisfying grammatical requirements at the first possible opportunity, and we hypothesized that as soon as the parser encounters an in-situ exclamative wh-phrase it generates a syntactic position that can host a licensor for the exclamative wh-phrase in the local clause. This closely parallels findings about the processing of interrogative wh-phrases.

In Experiment 2 we asked whether this parallelism between the processing of interrogatives and exclamatives would extend to an on-line reading-time study. Specifically, we tested whether the *Typing Mismatch Effect* (TME) shown for the processing of interrogatives by Miyamoto & Takahashi (2002) and Aoshima et al. (2004) would be found with exclamatives. The main finding of the experiment was clear: participants showed faster reading times after encountering the particle *-noda* on an embedded clause verb that followed an exclamative phrase, relative to matched conditions with the declarative complementizer *-to*. No corresponding slowdown was observed in the non-exclamative conditions, suggesting that the reading time effect was specifically due to the presence of an exclamative wh-phrase. We interpret this as a TME for exclamatives, thereby extending the parallel between the processing of interrogative and exclamative wh-phrases.

Nevertheless, it is important to address a couple of potential concerns about this result. First, the reading-time effect did not occur at the embedded verb itself, but rather was delayed by two regions, appearing on the prepositional phrase in Region 9. Also, the magnitude of the reading-time effect was somewhat small, relative to the effects that have been observed in previous studies with interrogatives. Although the delayed effect is potentially troubling, the two regions following the critical region were perfectly matched and contained no other likely causes of differential processing disruption. Therefore, we are confident that the reading-time slowdown in the condition with the declarative complementizer *-to* was a direct consequence of failure to find a local licensor for the exclamative wh-phrase. The smaller magnitude of the TME with exclamatives has a number of possible sources. It could reflect thte fact that exclamatives are less common than interrogatives and therefore create weaker expectations for a licensor. Alternatively, the weaker TME could reflect the fact that the licensing particle has a number of possible surface forms, as we have already seen (*-noda*, *-nodaroo*, *-nodarooka*, etc.). If upon encountering an exclamative wh-phrase a Japanese speaker immediately generates an expectation for a specific form of licensing particle, then he may be surprised to later encounter a different form of the licensing particle. A disruption of this kind would have the effect of attenuating the TME.

Another possible concern involves a contrast between Miyamoto & Takahashi's findings with interrogatives and our findings with exclamatives. Miyamoto & Takahashi found the opposite pattern of reading times in their interrogative and non-interrogative conditions. In the non-interrogative conditions speakers read verbs bearing Q-particles more slowly than they read verbs bearing the declarative complementizer, i.e., the opposite of their TME. In our study, in contrast, we found no corresponding reading time advantage for the declarative complementizer in the non-exclamative conditions. This difference may reflect a contrast in the status of the Q-particle *-ka* and the exclamative licensor *-noda*. Whereas the presence of the Q-particle *-ka* unambiguously types a clause as an interrogative, irrespective of the presence of a wh-phrase, the particle *-noda* does not uniquely function as a marker of exclamatives. Rather, it has the more general function of indicating that some constituent in the structure is focused (Hiraiwa & Ishihara, 2002; Ono, 2006). A clause containing *-noda* must still be typed as a declarative. Therefore, the processing of unexpected *-noda* in the non-exclamative conditions of the current experiment may have been less disruptive than the processing of unexpected *-ka* in Miyamoto & Takahashi's non-interrogative conditions.

4.   General Discussion

Previous studies on the processing of Japanese interrogatives have shown evidence for two types of locality bias in processing long-distance dependencies. The first is the finding that after they process an interrogative wh-phrase Japanese speakers expect to encounter a licensing Q-particle at the first grammatically available position (Miyamoto &

Takahashi, 2002). This suggests that the process of identifying the scope of an in-situ wh-phrase in Japanese is governed by the same mechanisms that govern the search for the thematic role of a fronted wh-phrase in English. The second line of evidence on locality biases in Japanese comes from studies of fronted wh-phrases in bi-clausal sentences, showing the surprising result that speakers prefer interpretations in which the fronted phrase is interpreted in the embedded clause, indicating a bias for long-distance scrambling (Aoshima et al., 2004). Aoshima and colleagues argue that this long-distance scrambling bias reflects the parser's goal of satisfying grammatical requirements at the first available opportunity, which in Japanese occurs at the embedded verb position, but they also emphasize that this effect could only come about if the Japanese parser is also able to reanalyze the main clause gap site that it initially builds before it receives evidence for a bi-clausal structure.

The value of investigating the processing of diverse types of syntactic dependencies is that it helps to identify the generality of the mechanisms involved in syntactic processing. In this article we conducted two experiments that compared the processing of exclamative wh-phrases in Japanese to existing generalizations about interrogative wh-phrases. An off-line sentence fragment completion task investigated both in-situ and fronted wh-phrases, and an on-line self-paced reading study focused on in-situ exclamatives. The results on in-situ exclamatives showed evidence that speakers expect the licensing particle -*nodaroo* or one of its variants to appear at the first verb position after the exclamative. This clearly parallels the locality bias observed for in-situ interrogatives, and provides support for the notion of a general-purpose predictive mechanism as the source of locality biases.

In contrast, the findings for fronted wh-phrases (which are based on the off-line task alone) less clearly support the notion of a parallel between interrogative and exclamative wh-phrases. Sentence fragment completion results showed that whereas most fronted interrogative wh-phrases were likely construed as embedded clause arguments, confirming the long-distance scrambling bias observed in previous studies, this was the case for only about one third of exclamative wh-phrases. There is a potential concern about the reliability of these findings, given the uncertainty about whether to treat completions with the complementizer -*ka* as errors or as appropriately completed exclamative constructions, but it is nevertheless important to consider the implications of this contrast, if it turns out to be robust. Also, it should be noted that the results from the fronted exclamative conditions do not show an overwhelming local scrambling bias: the fact that as many as a third of the fronted exclamatives were likely interpreted in the embedded clause is evidence that the factors that lead to the long-distance scrambling bias are still operative to some degree in exclamative constructions.

There are a number of possible sources for the reducedlong-distance scrambling bias in the exclamative conditions. If we assume, following Aoshima et al. (2004) that the long-distance scrambling bias results from the simultaneous need for grammatical constraint satisfaction and availability of unforced reanalysis, then we may infer that a change in either of these factors could lead to a weaker long scrambling bias.

The thematic properties of the fronted phrase are identical in interrogative and exclamative constructions, and therefore this is unlikely to be responsible for the differential strength of the long-distance scrambling bias. On the other hand, it is possible that the need for an interrogative wh-phrase to determine its scope as soon as possible exerts more pressure on the parser than the need for an exclamative wh-phrase to identify its licensing particle, thereby leading to a stronger long-distance scrambling bias in interrogative constructions.

Alternatively, the difference between interrogatives and exclamatives may be related to the availability of unforced reanalysis. For example, Ono (2006) argues that the additional functional structure required in an exclamative construction has the effect of making reanalysis from a structure with a main clause licensor to a structure with an embedded clause

licensor more costly. This account is appealing, because it makes it possible to capture the difference between in-situ and fronted exclamatives. However, one potential difficulty for this account is the fact that the rates of embedded clause licensing particles were almost identical in the interrogative and exclamative conditions, with the main difference between the conditions occurring in the rate of dative-selecting embedded verbs.

Another possibility is that long-distance scrambling analyses were more costly in the exclamative conditions because of the difficulty of long-distance scrambling out of an exclamative construction that is embedded under a non-emotive predicate (see (14b) above). This account is consistent with the fact that most main clause predicates generated in the fronted exclamative conditions were non-emotive predicates. This account relies on the assumption that the semantics of the main clause predicate – the final word of a Japanese sentence – is generated before the structural analysis of the fronted exclamative phrase is fixed. This assumption is plausible, but remains speculative at present.

Finally, the weaker long-distance scrambling bias in the exclamative conditions may simply reflect a strong independent preference for exclamative licensors to appear in a main clause. However, such an account would need to also explain why the main clause licensing preference does not impact the processing of in-situ exclamatives, which show a clear embedded clause licensing bias in Experiment 1.

Although our current results do not allow us to settle upon a unique account for the weaker long-distance scrambling bias in exclamative constructions, we may conclude that any account of the long-distance scrambling bias should take seriously the need to be able to capture fine-grained differences between different types of wh-phrase.

Acknowledgments

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Appendix A: Experimental Materials for Experiment 1.

Each of the items in this list represents one full set of stimuli from Experiment 1. Alternative words are given in parenthesis, separated by a slash (/). In fronted conditions, the parts in parenthesis are fronted to the beginning of the fragment.

1,その先生は学生が{どの女の子に}/{なんてたくさんの女の子に} …
sono sensee-wa gakusee-ga {dono onnanoko-ni}/{nante takusan-no onnanoko-ni}
that teacher-top student-nom {which girl-dat}/{wh-exc many-gen girl-dat}
2,店長はお客が{どの従業員に}/{なんてかわいい従業員に} …
tentyoo-wa okyaku-ga {dono zyuugyooin-ni}/{nante kawaii zyuugyooin-ni}
store manager-top customer-nom {which worker-dat}/{wh-exc cute worker-dat}
3,その女の子は彼氏が{どの男の子に}/{なんてちいさな男の子に} …
sono onnanoko-wa karesi-ga {dono otokonoko-ni}/{nante tiisana otokonoko-ni}
that girl-top boyfriend-nom {which boy-dat}/{wh-exc small boy-dat}
4,近所の奥さんはそのセールスマンが{どの老人に}/{なんてかわいそうな老人に} …
kinzyo-no okusan-wa sono seerusuman-ga {dono roozin-ni}/{nante kawaisoona roozin-ni}
neighbor-gen house wife-top that salesman-nom {which old man-dat}/{wh-exc poor old man-dat}
5,その社長は社員が{どの取引先に}/{なんてたくさんの取引先に} …
sono syatyoo-wa syain-ga {dono torihikisaki-ni}/{nante takusan-no torihikisaki-ni}
that president-top worker-nom {which customer-dat}/{wh-exc many-gen customer-dat}
6,組長は警察が{どの警察官に}/{なんてひ弱な警察官に} …
kumityoo-wa keesatu-ga {dono keesatukan-ni}/{nante hiyowana keesatukan-ni}
yakuza boss-top police-nom {which policeman-dat}/{wh-exc weak policeman-dat}
7,その活動家は市長が{どの家族に}/{なんて恵まれない家族に} …
sono katudooka-wa sityoo-ga {dono kazoku-ni}/{nante megumarenai kazoku-ni}
that activist-top mayor-nom {which family-dat}/{wh-exc poor family-dat}
8,部長は社長が{どの秘書に}/{なんて無能な秘書に} …
butyoo-wa syatyoo-ga {dono hisyo-ni}/{nante munoona hisyo-ni}
manager-top president-nom {which secretary-dat}/{wh-exc incompetent secretary-dat}
9,その医者は患者が{どの看護婦に}/{なんて役に立たない看護婦に} …
sono isya-wa kanzya-ga {dono kangohu-ni}/{nante yakunitatanai kangohu-ni}
that doctor-top patient-nom {which nurse-dat}/{wh-exc useless nurse-dat}
10,その助手は学生が{どの教授に}/{なんて頑固な教授に} …
sono zyosyu-wa gakusee-ga {dono kyoozyu-ni}/{nante gankona kyoozyu-ni}
that assistant-top student-nom {which professor-dat}/{wh-exc stubborn professor-dat}

11, 奥さんはお手伝いさんが{どのお客に}/{なんて失礼なお客に} …
okusan-wa otetudaisan-ga {dono okyaku-ni}/{nante situreena okyaku-ni}
wife-top house keeper-nom {which guest-dat}/{wh-exc impolite guest-dat}

12, その歌手はプロデューサーが{どの作詞家に}/{なんて人気のない作詞家に} …
sono kasyu-wa purodyuusaa-ga {dono sakusika-ni}/{nante ninkinonai sakusika-ni}
that singer-top producer-nom {which lyric writer-dat}/{which unpopular lyric writer-dat}

13, その社長はプログラマーが{どの下請けに}/{なんて多くの下請けに} …
sono syatyoo-wa puroguramaa-ga {dono sitauke-ni}/{nante ooku-no sitauke-ni}
that president-top programmer-nom {which subsidiary-dat}/{wh-exc many-gen subsidiary-dat}

14, 秘書はその政治家が{どの資産家に}/{なんて裕福な資産家に} …
hisyo-wa sono seezika-ga {dono sisanka-ni}/{nante yuuhukuna sisanka-ni}
secretary-top that politician-nom {which property owner-dat}/{wh-exc rich property owner-dat}

15, その魚屋は近所の八百屋が{どの子供たちに}/{なんて貧乏な子供たちに} …
sono sakanaya-wa kinzyo-no yaoya-ga {dono kodomotati-ni}/{nante binboona kodomotati-ni}
that fish dealer-top neighbor-gen vegetable dealer-nom {which children-dat}/{wh-exc poor children-dat}

16, 近所の花屋は隣のラーメン屋が{どの記者に}/{なんて高慢な記者に} …
kinzyo-no hanaya-wa tonari-no raamenya-ga {dono kisya-ni}/{nante koomanna kisya-ni}
neighbor-gen flower dealer-top next door-gen ramen dealer-nom {which writer-dat}/{wh-exc snobby writer-dat}

17, 助手はその教授が{どの学生に}/{なんてばかな学生に} …
zyosyu-wa sono kyoozyu-ga {dono gakusee-ni}/{nante bakana gakusee-ni}
assistant-top that professor-nom {which student-dat}/{which stupid student-dat}

18, その夫婦は子供たちが{どの友達に}/{なんて疎遠な友達に} …
sono huuhu-wa kodomotati-ga {dono tomodati-ni}/{nante soenna tomodati-ni}
that married couple-top children-nom {which friend-dat}/{which estranged friend-dat}

19, そのカップルはガイドが{どのドライバーに}/{なんて気難しいドライバーに} …
sono kappuru-wa gaido-ga {dono doraibaa-ni}/{nante kimuzukasii doraibaa-ni}
that couple-top guide-nom {which driver-dat}/{wh-exc hard to please driver-dat}

20, 担任は校長が{どの生徒に}/{なんてやさしい生徒に} …
tannin-wa kootyoo-ga {dono seeto-ni}/{nante yasasii seito-ni}
class teacher-top principle-nom {which student-dat}/{wh-exc kind student-dat}

21, 叔母は母親が{どの子供に}/{なんてさみしがりやの子供に} …
oba-wa hahaoya-ga {dono kodomo-ni}/{nante samisigariya-no kodomo-ni}
aunt-top mother-nom {which child-dat}/{wh-exc lonely-gen child-dat}

22, 牧師はボランティアが{どの病人に}/{なんて年寄りの病人に} …
bokusi-wa borantia-ga {dono byoonin-ni}/{nante tosiyori-no byoonin-ni}
clergyman-top volunteer-nom {which patient-dat}/{wh-exc old-gen patient-dat}

23, 監督は選手が{どのファンに}/{なんて熱心なファンに} …
kantoku-wa sensyu-ga {dono fan-ni}/{nante nessinna fan-ni}
manager-top player-nom {which fan-dat}/{wh-exc enthusiastic fan-dat}

24, スチュワーデスは機長が{どの乗客に}/{なんて太っている乗客に} …
sutyuwaadesu-wa kityoo-ga {dono zyookyaku-ni}/{nante hutotteiru zyookyaku-ni}
stewardess-top pilot-nom {which passenger-dat}/{wh-exc fat passenger-dat}

25, 指揮者は音楽家が{どのピアニストに}/{なんて若いピアニストに} …
sikisya-wa ongakuka-ga {dono pianisuto-ni}/{nante wakai pianisuto-ni}
conductor-top musician-nom {which pianist-dat}/{wh-exc young pianist-dat}

26, 妻は夫が{どの獣医に}/{なんていかつい獣医に} …
tuma-wa otto-ga {dono zyuui-ni}/{nante ikatui zyuui-ni}
wife-top husband-nom {which veterinarian-dat}/{wh-exc stern veterinarian-dat}

27, その国会議員は知事が{どの建設会社に}/{なんてうさんくさい建設会社に} …
sono kokkaigiin-wa tizi-ga {dono kensetugaisya-ni}/{nante usankusai kensetugaisya-ni}
that politician-top mayor-nom {which construction company-dat}/{wh-exc suspicious construction company-dat}

28, 記者はそのやくざが{どの女優に}/{なんて美しい女優に} …
kisya-wa sono yakuza-ga {dono zyoyuu-ni}/{nante utukusii zyoyuu-ni}
reporter-top that gang-nom {which actress-dat}/{wh-exc beautiful actress-dat}

29, 留学生はその医者が{どの婦長に}/{なんてやせた婦長に} …
ryuugakusei-wa sono isya-ga {dono hutyoo-ni}/{nante yaseta hutyoo-ni}
exchange student-top that doctor-nom {which chief nurse-dat}/{wh-exc skinny chief nurse-dat}
30, 店長はその販売員が{どの女性に}/{なんて気弱な女性に} …
tentyoo-wa sono hanbaiin-ga {dono zyosee-ni}/{nante kiyowana zyosee-ni}
store manager-top that worker-nom {which lady-dat}/{wh-exc weak lady-dat}

Appendix B: Experimental Materials for Experiment 2

Each of the items in this list represents a full set of stimuli from Experiment 2. In the Japanese items, alternative words are given in curly brackets, separated by a slash (/). English translations are provided only for the non-exclamative conditions (b) and (d). The alternative forms of the main clause and embedded verbs are given in curly brackets, separated by a slash (/). The words in square brackets correspond to the phrase that is an exclamative wh-phrase in the exclamative conditions (a) and (c). See example (16) for one full set of items.

1. そのウェイトレスは 料理長が {なんて/とても}要領の悪い見習いに 料理の 盛りつけを {頼んだのだ/頼んでいた}と キッチンの 裏で {こぼしていた。/言いふらしていたのだ。}
sono ueetoresu-wa ryoorityoo-ga {nante/totemo} yooryoonowarui minarai-ni ryoori-no morituke-o {tanonda-noda/tanondeita}-to kittin-no ura-de {kobositeita/iihurasiteita-noda}
that waitress-top chef-nom {wh-exc/very} inefficient apprentice-dat dish-gen garnish-acc {asked-exc/asked}-comp kitchen-gen behind-at {complained/spread the word-exc}
Behind the kitchen, that waitress {complained about/spread the word that} the chef {asking/asked} [a very inefficient apprentice] to garnish the dish.
2. その院長は 新人の 医者が {なんて/とても}年老いた患者に 困難な 手術を {するのだ/している}と 病院の 理事会で {怒っていた。/主張したのだ。}
sono intyoo-wa sinzin-no isya-ga {nante/totemo} tosioita kanzya-ni konnanna syuzyutu-o {suru-noda/siteiru}-to byooin-no rizikai-de {okotteita/syutyoosita-noda}
that chief doctor-top new doctor-nom {wh-exc/very} old patient-dat difficult operation-acc {conduct-exc/conduct}-comp hospital-gen executive meeting-at {got angry/exclaimed-exc}
At the executive meeting, that chief doctor {got angry about/exclaimed that} the new doctor {conducting/conducted} a difficult operation on [a very old patient].
3. その見習いは 思慮深い 棟梁が {なんて/とても}不器用な大工に 責任重大な 現場監督を {まかせたのだ/まかせていた}と 新築祝いの 打ち上げで {憤っている。/勘違いしたのだ。}
sono minarai-wa siryobukai tooryoo-ga {nante/totemo} bukiyoona daiku-ni sekininzyuudaina genbakantoku-o {makaseta-noda/makaseteita}-to sintikuiwai-no utiage-de {ikidootteiru/kantigaisita-noda}
that apprentice-top thoughtful chief-nom {wh-exc/very} clumsy builder-dat responsible management-acc {left-exc/left}-comp building ceremony-gen party-at {is angry/misunderstood-exc}
At the building dedication, that apprentice {is angry at/misunderstood that} the thoughtful chief {leaving/left} [a very clumsy carpenter] responsible for managing the place.
4. その秘書は 注意深い 教授が {なんて/とても}浅はかな学生に 重要な 仕事を {与えるのだ/与えていた}と 学科の 会議で {嘆いている。/思い込んだのだ。}
sono hisyo-wa tyuuibukai kyoozyu-ga {nante/totemo} asahakana gakusee-ni zyuuyoona sigoto-o {ataeru-noda/ataeteita}-to gakka-no kaigi-de {nageiteiru/omoikonda-noda}
that secretary-top careful professor-nom {wh-exc/very} careless student-dat important job-acc {give-exc/gave}-comp department-gen meeting-at {is lamenting/misunderstood-exc}
At the department meeting, that secretary {is lamenting/misunderstood that} the careful professor {giving/gave} an important job to [a very careless student].
5. その課長は 厳しい 部長が {なんて/とても}若い社員に 長期の 有給休暇を {与えたのだ/与えている}と 帰りの 電車で {嘆いている。/ふれ回ったのだ。}
sono katyoo-wa kibisii butyoo-ga {nante/totemo} wakai syain-ni tyooki-no yuukyuukyuuka-o {ataeta-noda/ataeteiru}-to kaeri-no densya-de {nageiteiru/huremawatta-noda}
that supervisor-top strict manager-nom {wh-exc/very} young worker-dat long-gen paid leave-acc {gave-exc/give}-comp return-gen train-at {is lamenting/spread the word-exc}
On the train home, that supervisor {is lamenting/spread the word that} the strict manager {giving/gave} [a very young worker] paid leave.
6. その演歌歌手は まじめな マネージャーが {なんて/とても}評判の悪いイベント会社に コンサートの 宣伝を {依頼したのだ/依頼している}と 事務所の 駐車場で {激怒している。/思い込んだのだ。}

sono enkakasyu-wa mazimena maneezyaa-ga {nante/totemo} hyoobannowarui ibentogaisya-ni konsaato-no senden-o {iraisita-noda/iraisiteiru}-to zimusyo-no tyuusyazyoo-de {gekidositeiru/omoikonda-noda}

that enka singer-top serious manager-nom {wh-exc/very} disreputable ad company-dat concert-gen ad-acc {asked-exc/ask}-comp office-gen parking-in {is furious/misunderstood-exc}

In the office parking lot, that enka singer {is furious about about/misunderstood that} the serious manager {asking/asked} [a very disreputable ad company] to advertise the concert.

7. そのミュージシャンは ベテランの マネージャーが {なんて/とても}うさんくさいプロデューサーに 新しいアルバムの 制作を {任せたのだ/任せている}と テレビ局の 楽屋で {憤慨していた。/非難したのだ。}

sono myuuzisyan-wa beteran-no maneezyaa-ga {nante/totemo} usankusai purodyuusaa-ni atarasii arubamu-no seisaku-o {makaseta-noda/makaseteiru}-to terebikyoku-no gakuya-de {hungaisiteita/hinansita-noda}

that musician-top experienced-gen manager-nom {wh-exc/very} odd producer-dat new album-gen produce-acc {asked-exc/asked}-comp TV station-gen green room-at {got angry/railed about-exc}

In the green room at the TV station, that musician {got angry about/railed about the fact that} the experienced manager {asking/asked} [a very odd producer] to produce the new album.

8. その校長は 常識的な 先生たちが {なんて/とても}幼い児童に 難しい 数学を {教えたのだ/教えていた}と 学校の 職員会議で {言い張っていた。/勘違いしたのだ。}

sono kootyoo-wa zyoosikitekina senseetati-ga {nante/totemo} osanai zidoo-ni muzukasii suugaku-o {osieta-noda/osieteita}-to gakkoo-no syokuinkaigi-de {iihatteita/kantigaisita-noda}

that principal-top responsible teachers-nom {wh-exc/very} young student-dat difficult math-acc {taught-exc/taught}-comp school-gen meeting-at {exclaimed/misunderstood-exc}

At the school meeting, that principal {exclaimed/misunderstood that} the responsible teachers {teaching/taught} difficult math to [very young children].

9. その銀行員は 堅実な 支店長が {なんて/とても}腹黒い商人に 多額の 融資を {認めたのだ/認めている}と 支店の 会議で {驚いている。/信じたのだ。}

sono ginkooin-wa kenzituna sitentyoo-ga {nante/totemo} haraguroi-ni syoonin-ni tagaku-no yuusi-o {mitometa-noda/mitometeiru}-to siten-no kaigi-de {odoroiteiru/sinzita-noda}

that bank worker-top conservative chief manager-nom {wh-exc/very} bad company-dat a lot-gen debt-acc {accepted-exc/accepted}-comp branch-gen meeting {is surprised/misunderstood-exc}

At the branch meeting, that bank worker {is surprised about/misunderstood that} the conservative chief manager {allowing/allowed} [a very bad campany] to borrow a lot of money.

10. その保護者は 正直そうな お巡りさんが {なんて/とても}たくさんの 子供に 強力な 覚せい剤を {広めたのだ/広めている}と PTAの 集まりで {告発していた。/言い張るのだ。}

sono hogosya-wa syoozikisoona omawarisan-ga {nante/totemo} takusan-no kodomo-ni kyooryokuna kakuseezai-o {hirometa-noda/hirometeiru}-to PTA-no atumari-de {kokuhatusiteita/iiharu-noda}

that parent-top respectable policeman-nom {wh-exc/very} many-gen children-dat strong drug-acc {spread-exc/spread}-comp PTA-gen meeting-at {pointed out/claimed-exc}

At the PTA meeting, that parent {pointed out/claimed that} the respectable policeman {giving/gave} strong drugs to [very many children].

11. その監督は やさしい 選手が {なんて/とても}行儀の悪い観客に チームの グッズを {配ったのだ/配っていた}と 遠征先の ホテルで {あきれている。/信じたのだ。}

sono kantoku-wa yasasii sensyu-ga {nante/totemo} gyooginowarui kankyaku-ni tiimu-no guzzu-o {kubatta-noda/kubatteita}-to enseesaki-no hoteru-de {akireteiru/sinzita-noda}

that manager-top kind player-nom {wh-exc/very} ill-mannered spectator-dat team-gen goods-acc {provided-exc/provided}-comp expedition-gen hotel-at {is amazed/mistook-exc}

At the hotel, that manager {is amazed about/wrongly mistook the fact that} the kind player {providing/provided} team goods to [a very ill-mannered spectator].

12. その監督は 忍耐強い 選手が {なんて/とても}多くの ファンに ひどい 悪口を {言ったのだ/言っていた}と ベンチの 裏で {がっかりしている。/勘違いしたのだ。}

sono kantoku-wa nintaizuyoi sensyu-ga {nante/totemo} ooku-no fan-ni hidoi waruguti-o {itta-noda/itteita}-to benti-no ura-de {gakkarisiteiru/kantigaisita-noda}

that manager-top patient player-nom {wh-exc/very} many-gen fan-dat bad words-acc {told-exc/told}-comp bench-gen behind-at {is disappointed/misunderstood-exc}

Behind the bench, that manager {is disappointed about/misunderstood that} the patient player {swearing/swore} at [very many fans].

13. その球団社長は 寛容な 監督が {なんて/とても}優秀なピッチャーに 厳しい 罰を {与えたのだ/与えた}と 球場の ブルペンで {がっかりしている/期待しているのだ}。

sono kyuudansyatyoo-wa kanyoona kantoku-ga {nante/totemo} yuusyuuna pityaa-ni kibisii batu-o {ataeta-noda/ataeta}-to kyuuzyoo-no burupen-de {gakkarisiteiru/kitaisiteiru-noda}

that owner-top patient manager-nom {wh-exc/very} great pitcher-dat harsh penalty-acc {gave-exc/gave}-comp ball park-gen bullpen-at {is disappointed/expected-exc}

In the bullpen of the ballpark, that owner of the team {is disappointed about/sees that} the patient manager {giving/gave} a harsh penalty to [a very talented pitcher].

14. そのカメラマンは 有能な アシスタントが {なんて/とても}たくさんの女優に 写真集の モデルを {頼んだのだ/頼んでいた}と スタジオの 控え室で {悔やんでいる。/誤解したのだ。}

sono kameraman-wa yuunoona asisutanto-ga {nante/totemo} takusan-no zyoyuu-ni syasinsyuu-no moderu-o {tanonda-noda/tanondeita}-to sutazio-no hikaesitu-de {kuyandeiru/gokaisita-noda}

that cameraman-top efficient assistant-nom {wh-exc/very} many actress-dat photo album-gen model-acc {asked-exc/asked}-comp studio-gen room-at {regret/misunderstood-exc}

In the studio green room, that cameraman {regrets/misunderstood that} the efficient assistant {asking/asked} [very many acresses] to be models in a photo album.

15. その町内会長は 実直な 村長が {なんて/とても}がらの悪い テキ屋に 祭りの 手伝いを {させたのだ/させていた}と 近所の 会合で {びっくりした。/噂したのだ。}

sono tyoonaikaityoo-wa zittyokuna syuhu-ga {nante/totemo} garanowarui tekiya-ni maturi-no tetudai-o {saseta-noda/saseteita}-to kinzyo-no kaigoo-de {bikkurisita/uwasasita-noda}

that local official-top honest mayor-nom {wh-exc/very} bad street vendor-dat festival-gen help-acc {let-exc/let}-comp neighborhood-gen meeting-at {surprised/gossiped-exc}

At the neighborhood meeting, that local official {was surprised about/gossiped that} the honest mayor {asking/asked} [a very bad street vendor] to help with the festival.

16. その大学生は 頼もしい 指導教官が {なんて/とても}評判の悪い 教授に 優秀な 友達を {推薦したのだ/推薦していた}と 研究室の 前で {がっかりしていた。/決めつけたのだ。}

sono daigakusee-wa tanomosii sidookyookan-ga {nante/totemo} hyoobannowarui kyoozyu-ni yuusyuuna tomodati-o {suisensita-noda/suisensiteita}-to kenkyuusitu-no mae-de {gakkarisiteita/kimetuketa-noda}

that student-top reliable professor-nom {wh-exc/very} disreputable professor-dat talented friend-acc {recommended-exc/recommended}-comp office-gen front-at {was disappointed/asserted-exc}

In front of the office, that student {was disappointed about/asserted that} the reliable professor {recommending/recommended} a talented friend to [a very disreputable professor].

17. その社長は 聡明な 秘書が {なんて/とても}大事な 取引先に 大きな 損害を {与えたのだ/与えている}と 役員の 会議で {失望している。/誤解したのだ。}

sono syatyoo-wa soomeina hisyo-ga {nante/totemo} daizina torihikisaki-ni ookina songai-o {ataeta-noda/ataeteiru}-to yakuin-no kaigi-de {situboosita/gokaisita-noda}

that president-top smart secretary-nom {wh-exc/very} important customer-dat big loss-acc {caused-exc/caused}-comp executive-gen meeting-at {is disappointed/misunderstood-exc}

At the executive meeting, that president {is disappointed about/misunderstood that} the smart secretary {causing/caused} a big loss to [a very important customer].

18. その女優は 実力派の 監督が {なんて/とても}有名な 男優に 次回作の 脇役を {頼んだのだ/頼んでいた}と ロケバスの 中で {あきれている。/期待したのだ。}

sono zyoyuu-wa zituryokuha-no kantoku-ga {nante/totemo} yuumeena danyuu-ni zikaisaku-no wakiyaku-o {tanonda-noda/tanondeita}-to rokebasu-no naka-de {akireteita/kitaisita-noda}

that actress-top skillful-gen director-nom {wh-exc/very} famous actor-dat next movie-gen supporting actor-acc {asked-exc/ask}-comp broadcast van-gen inside-at {is amazed/anticipated-exc}

In the broadcast van, that actress {is amazed at/anticipated that} the skillful director {asking/asked} [a very famous actor] to be a supporting actor in the next movie.

19. その社長は 新しい 部下が {なんて/とても}頑固な 取引先に 長期の 契約を {とりつけたのだ/とりつけた}と 年度末の 株主総会で {感心している。/願ったのだ。}

sono syatyoo-wa atarasii buka-ga {nante/totemo} gankona torihikisaki-ni tyooki-no keeyaku-o {torituketa-noda/torituketa}-to nendomatu-no kabunusisookai-de {kansinsiteiru/negatta-noda}

that president-top new worker-nom {wh-exc/very} difficult customer-dat long term-gen contract-acc {made-exc/made}-comp end of year-gen stock holder meeting-at {is impressed/wished-exc}

At the year-end stock holder meeting, that president {is impressed by/wished that} the new worker {making/had made} a long-term contract with [a very difficult customer].

20. そのマネージャーは 生意気な アイドルが {なんて/とても}たくさんのファンに 直接 サイン色紙を {渡したのだ/渡していた}と コンサートの 会場で {感動していた。/言い張ったのだ。}

sono maneezyaa-wa namaikina aidoru-ga {nante/totemo} takusan-no fan-ni tyokusetu sainsikisi-o {watasita-noda/watasiteita}-c konsaato-no kaizyoo-de {kandoositeita/iihatta-noda}

that manager-top insolent idle-nom {wh-exc/very} many-gen fan-dat directly autograph-acc {gave-exc/gave}-comp concert-gen place-at {was moved/claimed-exc}

At the concert, that manager {was moved by/claimed that} the insolent idol {giving/gave} an autograph directly to [very many fans].

21. その編集者は 無名の 作家が {なんて/とても}たくさんの 読者に 深い 感動を {与えたのだ/与えている}と 出版社の 編集会議で {言っていた。/誇張したのだ。}

sono hensyuusya-wa mumei-no sakka-ga {nante/totemo} takusan-no dokusya-ni hukai kandoo-o {ataeta-noda/ataeteiru}-to syuppansya-no hensyuukaigi-de {itteita/kotyoosita-noda}

that editor-top unknown-gen writer-nom {wh-exc/very} many-gen readers-dat deep impression-acc {gave-exc/gave}-comp publisher-gen editorial meeting-at {mentioned/exaggerated-exc}

At the meeting at the publisher's office, that editor {mentioned/exaggerated the claim} that the unknown writer made a strong impression on [very many readers].

22. その牧師は 熱心な 信者が {なんて/とても}たくさんの 人々に 心の 安らぎを {もたらしたのだ/もたらしている}と 教会の バザーで {感動していた。/宣伝したのだ。}

sono bokusi-wa nessinna sinzya-ga {nante/totemo} takusan-no hitobito-ni kokoro-no yasuragi-o {motarasita-noda/motarasiteiru}-to kyookai-no bazaa-de {kandoositeita/sendensita-noda}

that clergy-top enthusiastic congregation-nom {wh-exc/very} many-gen people-dat heart-gen peace-acc {provided-exc/provided}-comp church-gen bazaar-at {was moved/announced-exc}

At the church bazaar, that clergyman {was moved by/announced that} the enthusiastic congregation {providing/provided} peace of mind to [very many people].

23. その画家は 画廊の 主人が {なんて/とても}たくさんの コレクターに 偽物の 作品を {売り払ったのだ/売り払っている}と 展覧会の 会場で {激怒していた。/誤解していたのだ。}

sono gaka-wa garoo-no syuzin-ga {nante/totemo} takusan korekutaa-ni nisemono-no sakuhin-o {uriharatta-noda/uriharatteiru}-to tenrankai-no kaizyoo-de {gekidositeita/gokaisiteita-noda}

that painter-top gallery-gen manager-nom {wh-exc/very} many collector-dat fake-gen product-acc {sold-exc/sold}-comp exhibition-gen place-at {got angry/misunderstood-exc}

At the art exhibition, that painter {got angry at/misunderstood that} the manager of the art gallery {having/had} sold fake art work to [very many collectors].

24. その力士は がんこな 親方が {なんて/とても}たくさんの 新弟子に 深夜の 外出を {許可してしまったのだ/許可してしまった}と 雑誌の 記事で {おどろいている。/勘違いしたのだ。}

sono rikisi-wa gankona oyakata-ga {nante/totemo} takusan-no sindesi-ni sinya-no gaisyutu-o {kyokasitesimatta-noda/kyokasitesimatta}-to zassi-no kizi-de {odoroiteiru/kantigaisita-noda}

that sumo wrestler-top stubborn boss-nom {wh-exc/very} many-gen new apprentice-dat mid night-gen stayout-acc {allowed-exc/allowed}-comp magazine-gen article-at {is surprized/misunderstood-exc}

In the magazine article, that sumo wrestler {is surprised at/misunderstood that} the stubborn sumo boss {allowing/allowed} [very many new apprentices] to stay out until midnight.