Psychologia, 2014, **57**, 164–176

THE ROLE OF SENTENCE INFORMATION IN READING SPAN PERFORMANCE: AN EXAMINATION OF THE RECALL RECONSTRUCTION HYPOTHESIS

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Recent studies assessing working memory suggest that sentence representations can support recall during reading span tests (RST). However, mechanisms underlying this positive effect have not been precisely identified. The present study examined the influence of sentence representations on recall performance during an RST by manipulating both, the type of target words (focus or non-focus words within the sentence) and word frequency of non-target sentence words. Results showed that (1) recall performance was lower for the low-frequency RST, where a non-target was a low-frequency word, than for a high-frequency RST; (2) there was a robust focus effect, with an advantage for focus words compared to non-focus targets; and (3) there were no interactions between the frequency and focus manipulations. The results indicate that sentence representations have an important role in RST performance.

Key words: sentence information, working memory, recall reconstruction hypothesis

Working memory (WM) is a system for the temporary storage of information required for the performance of a variety of cognitive tasks (Baddeley, 2007; Baddeley & Hitch, 1974). It is known that there are large individual differences in WM capacity, which has been assessed by WM span tasks. The reading span test (RST; Daneman & Carpenter, 1980) is one of the most commonly used WM span tasks. This test requires participants to read unrelated sentences aloud with increasing cognitive load, while remembering target words presented within the sentences. A notable feature of the RST is that scores on this task correlate with measures of higher cognitive abilities, such as language comprehension (Daneman & Carpenter, 1980; Daneman & Merikle, 1996; Just & Carpenter, 1992). Therefore, exploring characteristics of factors involved in RST performance should contribute to better understanding the WM mechanisms operating within a variety of cognitive tasks. For example, RST sentence length (Saito & Miyake, 2004; Towse, Hitch, & Hutton, 1998) and sentence complexity (Waters, 1996) negatively affect RST scores. Correspondingly, sentence representations within WM tasks are believed to interfere with target word retention (e.g., Engle, Kane, & Tuholski, 1999). This line of research has

This work was supported by a Grant-in-Aid for Global COE (Centers of Excellence) Program (D07) by Japan's Ministry of Education, Culture, Sports, Science, and Technology.

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revealed mechanisms related to maintenance and forgetting in WM (e.g., Barrouillet, Bernardin, & Camos, 2004).

However, sentence representations sometimes provide useful information for WM processes, and thus, facilitate target word recall. For example, Osaka, Nishizaki, Komori, and Osaka (2002) reported *focus effect* in an experiment, where they manipulated the status of a target word in each sentence presented in a Japanese RST. The target word was either the "focus" word (i.e., the most important word for understanding the sentence) or a less central "non-focus" word related to sentence meaning. In this procedure, a focus word was defined as a sentence word that was selected as the most important word for sentence comprehension by more than 70% of the participants in a preliminary study. For example, "stains" is the focus word in the following sentence: "The child dropped food on his jacket and make stains." The non-focus word in this sentence is "jacket." The authors found that recall performance was better when target words were focus words rather than non-focus words. The authors termed this the "focus effect." Finally, the authors found that focus words were erroneously recalled more frequently than other words within the RST sentences in the non-focused condition. These results suggested that sentence meaning derived from reading might facilitate recall of focused target words.

Towse, Cowan, Hitch, and Horton (2008) examined the relationship between sentence representation and target recall in the RST from a different perspective. These authors compared recall performance on the RST in two conditions. In one condition, a target word was part of a sentence (integrated condition), whereas in another condition a target word was semantically unrelated to the sentence and presented separately from the sentence (independent condition). For example, in the integrated condition, the to-be-remembered word was "space" in the following sentence: "The rocket went into outer space." Conversely, in the independent condition, the to-be-remember word was "bridge" in the following: "The rocket went into outer space–bridge." Towse et al. (2008) controlled the timing parameters in order to equate durations across task conditions. They showed that recall performance was better in the integrated condition than in the independent condition. Although there could be several potential sources for superior performance in the integration condition, Towse et al. (2008) suggested that sentence representations in the RST could be scaffolds for later target word recall. This assumption was supported by chronometric data from oral or manual recall on a touch panel, which showed that recall latency was longer in the integrated condition than the independent condition. These results indicated that participants accessed sentence representations during the recall phase to achieve target recall in the integrated condition, which caused a delay in recall. The access to sentence representations should not facilitate target recall in the independent condition. Based upon these considerations, Towse et al. (2008) proposed the recall reconstruction hypothesis (RRH), which assumes that sentence representations are available and accessible during the recall phase for reconstruction of decaying target representations. The authors also argued that the focus effect is the supporting evidence for the RRH.

Data reported in Towse et al. (2008) strongly suggests that sentence representations derived from processing phases in the RST affect recall performance positively, even though participants were not explicitly required to use sentence meaning during recall. It

must be noted, however, that their focus was not to specify which representations or information within sentences facilitated target recall.

One straightforward assumption is that whole or global sentence representations could provide the general idea or gist of the sentence, which might help recall. In other words, sentence meaning might facilitate retrieval of a target word in the RST. Thus, the presence of the focus effect in the RST supports this view. Osaka et al. (2002) suggested that participants identify the focus of a sentence while reading the stimuli, and pay attention to the central meaning word within the sentence. This suggestion indicates that identification of the focus word, which is the most important word for understanding the sentence, requires processing of sentence representations. In Osaka and colleagues' study, the target word in the focused condition was the focus word, where recall could benefit from the sentence representation. In contrast, the target word in the non-focused condition was a non-focus word, where recall might not be facilitated by the sentence representation. Thus, better recall performance in the focused condition (i.e., the focus effect) might reflect the advantage of a focus word over non-focus words because of the availability of sentence representations.

A recent study indirectly supported the notion of a sentence representation contribution to RST performance. Schroeder, Copeland, and Bies-hernandez (2012, Experiment 1) reported that RST performance was better when each span list constructed a short story (i.e., sentences in a span list were thematically related to each other, referred to as a story span task) than when a list consisted of semantically independent sentences. This finding is consistent with the idea that target word retrieval during the RST benefits from the presence of sentence meaning.

These studies suggest that sentence representations in the RST might have a beneficial effect on recall performance. However, Schroeder et al. (2012) manipulated just the relationship between sentences in an RST list but not representations within each sentence. Thus, this study did not directly show that sentence representations beneficially affect recall of a target word in a given sentence, as assumed by the RRH (Towse et al., 2008). Similarly, both Osaka et al. (2002) and Towse et al. (2008) did not manipulate sentence representations in each RST sentence, rather they demonstrated that manipulating the relationship between a target word and its related sentence affected target word recall performance. In order to test the core assumption of the RRH, that is, recall performance in working memory span tests, including RST, may not simply reflect retrieval of the to-be-remembered words in isolation, and sentence representations may work as a retrieval cue for the target word (among other potential retrieval cues), we need to manipulate sentence representations within each RST sentence.

For this purpose, the current study employed one factor assumed to affect sentence representations: word frequency of a sentence word. Marks, Doctorow, and Wittrock (1974) found that, among child readers, text that includes low-frequency words were less understood than text in which low-frequency words were replaced with high-frequency words. Commonly, it is believed that sentence readability is inhibited by low-frequency words within a text (Sheehan, Kostin, Futagi, & Flor, 2010), and manipulating word frequency is one method to modulate readability (Feng, D'Mello, & Graesser, 2013). In

addition, eye-tracking methods have revealed that readers show longer fixation durations toward low-frequency words in a sentence than high-frequency words, but only in a reading condition and not during a visual search task (Rayner & Raney, 1996). These studies suggest that the presence of a low-frequency word within a sentence interrupts the readability and comprehension of a sentence. Consequently, this is assumed to affect the quality of sentence representations.

From this perspective, we expect that the presence of a low-frequency word in a reading span sentence could decrease the readability and comprehension of the sentence and consequently decreased the potential availability of the sentence representation. If sentence representations support retrieval of a target word in the RST, the presence of a low-frequency word might negatively affect RST performance. We tested this assumption in the current study. In addition to the word frequency effect, we also attempted to replicate the focus effect (Osaka et al., 2002), and examined whether manipulating sentence representations affects the occurrence of the focus effect. Although we do not have specific prediction regarding the interaction between the word-frequency manipulation and the focus effect, the result from the present experiment should provide clues to understand the characteristics of sentence representations that affect recall performance in RST.

METHOD

Participants

Participants were 62 undergraduate students (34 females and 28 males; mean age = 20.65 years, *SD* = 1.69) from Shinshu University (Matsumoto, Japan). Participants were randomly assigned to four RST conditions: focused and low-frequency RST (FL-RST; $n = 16$); focused and high-frequency RST (FH-RST; $n = 16$); non-focused and low-frequency RST (NFL-RST; $n = 15$); and non-focused and high-frequency RST (NFH-RST; $n = 15$). None of the students had participated in any preliminary tests for material selection. Due to the limited number of stimulus sentences selected, it is impossible to employ a within-subjects design, which requires splitting the material sets for counterbalancing. Therefore, we had two between-subjects factors for this study. Participants provided informed consent and received a small remuneration for their participation.

Materials

Reading Span Test. We created four Japanese RSTs, with each corresponding to one of the four RST conditions as follows: (1) FL-RST: target word was the focus word in each sentence, which included a low-frequency word; (2) FH-RST: a target word was a focus word in each sentence, which included a high-frequency word; (3) NFL-RST: a target word was a non-focus word in each sentence, which included a low-frequency word; and (4) NFH-RST: a target word was a non-focus word in each sentence, which included a high-frequency word. Examples of these four RSTs are shown in Table 1. Each of the four RSTs included 42 sentences (Osaka et al., 2002, included 70 sentences). The sentences for the focused and non-focused RSTs were identical, but the target words were the focus word for the former and the non-focus word for the latter. Sentences for the low- and high-frequency RSTs were the same except for the frequency manipulation words, which were neither target nor focus words. Within the stimulus examples presented in Table 1, the target words (both focus and non-focus) are within the same phrase that contains the frequency manipulation word. Nearly half of the 42 stimulus sentences were of this type (19 for the focused condition and 21 for the non-focused condition). In 23 focused sentences and 21 non-focused sentences, the target word and the frequency manipulation word were in different phrases. In an example sentence from the FL-RST condition, “善悪や教理ではなく，祈りにこそ真実がある (The truth lies in prayers, not in good and evil or doctrines),” the focus target word was “祈り (prayers)” and the frequency manipulation word was “教理 (doctrines, a low-frequency

Table 1. Examples of four RSTs

(1) Focused and Low-frequency (FL-RST)		
The children heard a lullaby with *lamentation*.		
Target word: lullaby	Focus word: lullaby	Low-frequency word: *lamentation*
（その子どもたちは，*哀調*をおびた子守歌を聞かされた。）		
Target word: 子守歌	Focus word: 子守歌	Low-frequency word: *哀調*
(2) Focused and High-frequency (FH-RST)		
The children heard a lullaby with *sadness*.		
Target word: lullaby	Focus word: lullaby	High-frequency word: *sadness*
（その子どもたちは，*悲しみ*をおびた子守歌を聞かされた。）		
Target word: 子守歌	Focus word: 子守歌	High-frequency word: *悲しみ*
(3) Non-focused and Low-frequency (NFL-RST)		
The children heard a lullaby with *lamentation*.		
Target word: children	Focus word: lullaby	Low-frequency word: *lamentation*
（その子どもたちは，*哀調*をおびた子守歌を聞かされた。）		
Target word: 子どもたち	Focus word: 子守歌	Low-frequency word: *哀調*
(4) Non-focused and High-frequency (NFH-RST)		
The children heard a lullaby with *sadness*.		
Target word: children	Focus word: lullaby	High-frequency word: *sadness*
（その子どもたちは，*悲しみ*をおびた子守歌を聞かされた。）		
Target word: 子どもたち	Focus word: 子守歌	High-frequency word: *悲しみ*

Note: Target words were underlined with red during the study. Frequency-manipulated words are written in italics, although in the study, these words were in a normal font.

word).” See the appendix for all RST sentence stimuli. The mean log-transformed occurrence frequency values for the low- and high-frequency words, focus words, and non-focus words were 1.79, 3.77, 3.19, and 3.77, respectively, in the NTT psycholinguistic database (Amano & Kondo, 2000).

The 42 sentences for the RSTs were selected from 104 sentences in Japanese language school textbooks for the third year of junior high school, as well as the first and third years of high school through preliminary tests. Thus, undergraduate students who participated in the present study could read the stimuli without any problems. For the selection of focus words, a group of undergraduate students (n = 45) attempted to identify the focus words within the 104 sentences. Similar to Osaka et al. (2002), participants were requested to identify and select the word that was most important and critical to understand the sentence. Although Osaka et al. (2002) used focus words selected by more than 70% of participants, in the present study, we used focus words selected by more than 65% of the students due to constraints related to the number of sentences available. The number of letters included in a sentence ranged from 18 to 25 (mean = 22.19, SD = 1.67, in the

focused condition, and mean = 22.00, *SD* = 1.58, in the non-focused condition). The first letter of a focus target was located, on an average, at the 14.30th (*SD* = 4.84) position within a sentence; location of a non-focus target was at the 7.50th (*SD* = 5.02) position.

Procedure

We followed the RST administration procedure (e.g., font size and color) of Osaka et al. (2002), and Osaka and Osaka (1994). We used Microsoft PowerPoint 2003 for stimulus presentation. The RST set sizes ranged from two to five, and there were three trials for each set size. Participants were required to read the sentences in each set size aloud and remember the target words, which were underlined in red within each sentence. After reading all the sentences in each trial, a blank slide was presented as a recall cue. Participants were asked to recall the target words. They were allowed to recall the target words irrespective of presentation order, with the exception that the last target word in each set should not be recalled first. This was done to prevent possible recency effects (cf. Osaka et al., 2002). Although the recent standard recall procedure of the RST is serial order recall, we employed the above-mentioned method following the procedure used by Osaka et al. (2002), which examined the focus effect. The time limit for recall was 5 seconds per target word. For example, the time limit was 25 seconds, when the set size was five. Accordingly, if a participant recalled only two words in a set of five by the end of the 25-second recall period, the remaining three unrecalled words were treated as omission errors. In addition, participants were required to complete all 12 trials in order to obtain a total recall score of RST performance (see Conway et al., 2005; Friedman & Miyake, 2005). Thus, the maximum possible score was 42. We recorded all participants' recall data for analysis of recall performance and recall errors. Before the test trials, two practice trials were conducted using the stimuli from Osaka (2002).

RESULTS

Recall performance

The means for the total words recalled for RST are presented in Fig. 1. Recall performance was subjected to an analysis of variance (ANOVA) that included target word focus (focused or non-focused) and word-frequency manipulation (low- or high-frequency) as factors. There was a significant main effect of focus, $F(1, 58) = 21.26$, $MSE = 22.97$,

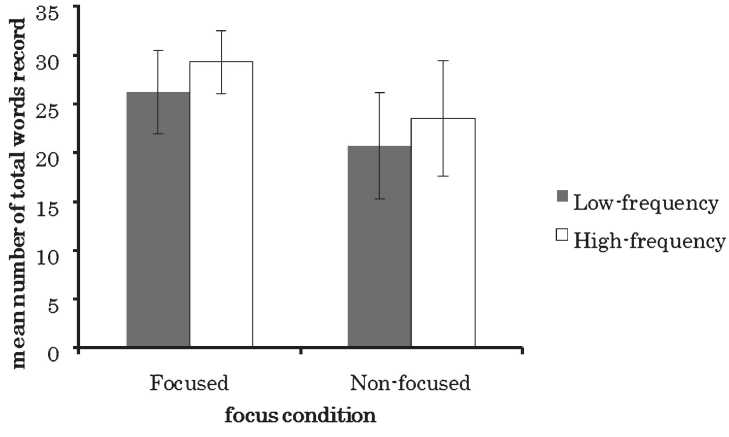

Fig. 1. Mean number of words recalled (out of 42) and standard error bars of correct recall for the four reading span tests.

$\eta_p^2 = .27$, $p < .01$. Recall performance was better in the focused condition than in the non-focused condition. There was also a significant main effect of frequency, $F(1, 58) = 5.91$, $MSE = 22.97$, $\eta_p^2 = .09$, $p < .05$. Recall performance was lower when the sentences included a low-frequency word than when the sentences included a high-frequency word. There was no significant interaction between these two factors, $F(1, 58) = .01$, $MSE = 22.97$, $\eta_p^2 = .00$, $p = .89$, *n.s.*

Error analysis

We classified errors into three categories. The first was *omission errors*, where participants could not recall a word within the time limit. The second category was *intra-sentence intrusion errors*, where participants incorrectly recalled a non-target word from the same sentence. For the non-focused RST, this intrusion error category was further categorized as *focused-intrusion errors*, where were focus words in the sentence were incorrectly recalled, and *other-intrusion errors*, where recalled words were neither target words nor focus words. The third category were *extra-sentence intrusion errors*, which included words from preceding trials or from outside the experimental materials. These error rates are shown in Table 2. Analyses for all three types of errors were based on a factorial design used in the analysis of recall performance with the same factors as follows: target word focus (focused or non-focused) and frequency manipulation (low- or high-frequency). In the following statistical analyses, error rates were angular transformed.

Table 2. Recall performance and error rates for each of the four RSTs

	RST-type			
	Focused condition		Non-focused condition	
	FL-RST	FH-RST	NFL-RST	NFH-RST
Total words recalled	62.35% (10.14)	69.79% (7.66)	49.36% (12.96)	56.03% (14.08)
Omission error	30.95% (8.06)	26.19% (7.11)	36.34% (6.99)	29.52% (12.46)
Intra-sentence intrusion error	5.05% (4.83)	2.52% (2.21)	12.53% (9.06)	12.06% (6.00)
Focus word intrusion error	—	—	6.26% (4.51)	7.69% (4.98)
Other word intrusion error	5.05% (4.83)	2.52% (2.21)	6.26% (6.24)	4.36% (2.68)
Extra-sentence intrusion error	1.63% (2.71)	1.48% (1.47)	1.74% (1.90)	2.38% (3.48)

Note: FL-RST = Focused & Low-frequency RST; FH-RST = Focused & High-frequency RST; NFL-RST = Non-focused & Low-frequency RST; NFH-RST = Non-focused & High-frequency RST. Standard deviations are in parentheses.

Omission errors: There was a marginally significant main effect of focus, $F(1, 58) = 3.34$, $MSE = 32.86$, $\eta_p^2 = .05$, $p = .073$. The omission error rate tended to be lower in the focused condition than in the non-focused condition. There was a significant main effect of frequency, $F(1, 58) = 6.59$, $MSE = 32.86$, $\eta_p^2 = .10$, $p < .05$. The omission error rate was higher when a sentence included a low-frequency word than when a sentence included a high-frequency word. There was no interaction between these two factors, $F(1, 58) = .26$, $MSE = 32.86$, $\eta_p^2 = .00$, $p = .60$, *n.s.*

Intra-sentence intrusion errors: There was a significant main effect of focus, $F(1, 58) = 39.55$, $MSE = 42.57$, $\eta_p^2 = .40$, $p < .01$. The intra-sentence intrusion error rate was lower in the focused condition than in the non-focused condition. There was neither a significant main effect of frequency, $F(1, 58) = 1.06$, $MSE = 42.57$, $\eta_p^2 = .01$, $p = .30$, *n.s*, nor a significant interaction between these two factors, $F(1, 58) = 1.37$, $MSE = 42.57$, $\eta_p^2 = .02$, $p = .24$, *n.s.* We also compared the focused-intrusion error rate and the other-intrusion error rate in the non-focused condition. In the high-frequency condition, there were more focused-intrusion errors than other-intrusion errors, $t(14) = 2.43$, $d = .83$, $p < .05$. However, in the low-frequency condition, percentages of the two types of errors were not significantly different, $t(14) = .00$, $d = .00$, $p = 1.00$, *n.s.*

Extra-sentence intrusion errors: There were neither significant main effects nor any significant interaction, all Fs < 1.

Discussion

The main findings from the present study are as follows: (1) we replicated the focus effect during RST recall, with an advantage for focus words over non-focus targets. (2) The most striking result was related to the effect of our frequency manipulation on recall performance. A change in frequency for only one non-target word within an RST sentence dramatically changed recall levels of the same target word, with an advantage for a high-frequency word over a low-frequency word. (3) These two effects did not interact significantly.

We replicated the focus effect even though the identification rate of focus words in this study (65%) was slightly lower than that in the original study (70%) by Osaka et al. (2002). Although we could not make a simple comparison of RST performance between the current study and Osaka and colleagues' study, the difference between the focus/non-focus conditions was similar between the two studies (i.e., about 10 percentage points).

We also found an effect of word frequency as predicted. RST performance in the low-frequency condition was lower than the high-frequency condition. This result suggests that our frequency manipulation was adequate, and sentence representations within the RST certainly play a beneficial role in target word recall. One issue that should be mentioned here might be the one regarding the non-significant interaction between the two factors (focus and frequency). In general, the absence of an interaction between two factors implies that these factors could operate independently (but not necessary be completely exclusive each other). It was initially possible for us to assume that these two effects were

based on the similar mechanisms – both were driven by the same sentence representations. If this were the case, we would expect the focus effect that affects sentence representations to be smaller in the low-frequency condition than in the high-frequency condition given that the presence of a low-frequency word disrupts the creation of strong sentence representations

One possible explanation for the absence of the interaction between the frequency and focus effects could be that, as we have argued, low frequency words might disrupt sentence coherence creating the frequency effect on the one hand, whereas the focus word might affect how much the sentence reminds or specifies what the target word is on the other hand. These two factors could operate independently to affect retrieval processes.

Of course, the above assumption is tentative and needs to be examined further in the future studies. But the present data at least draw a conclusion that sentence representations might be useful scaffolds for RST recall performance rather than act as distractors of recall. This conclusion is accompanied with some emphases that the frequency effect has not been explored extensively in the working memory literature, that the effect has not been investigated in relation to other manipulations such as the focus effect, and that each manipulation potentially affects the sentence context available to participants at recall.

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(Manuscript received 5 March, 2013; Revision accepted 1 March, 2014)

Appendix

Each sentence was selected from Japanese school textbooks. The focus word is the most important word for understanding the sentence. A non-focus word was not a frequency-manipulation word. A frequency-manipulation word is italicized in this appendix (but not during the experimental tasks). HF stands for high-frequency word and LF stands for low-frequency word. High- and low-frequency words have similar meanings in Japanese. However, when a low-frequency word had no similar high-frequency word, we employed a high-frequency word so that readers could make sense of the sentence.

The truth lies in prayers, not in good and evil or *teaching*.
（善悪や*教え*ではなく、祈りにこそ真実がある。）
Focus: prayer; non-focus: truth; HF: 教え ; NF: 教理

It was said that it was going to be sunny, but it rained from *sky*.
（晴天と言っていたが*空*から雨が落ちてきそうだ。）
Focus: rained; non-focus: sunny; HF: 空 ; LF: 曇天

Humans *depend on* science to acquire satisfaction.
（人類は自らの満足を得るために，科学に*依存*した。）
Focus: science; non-focus: satisfaction; HF: 依存 ; LF: 仮託

This is *evidence* for latitude, which humans have.
（これは，人間のもつ高い自由度の*証拠*となりえる。）
Focus: latitude; non-focus: human; HF: 証拠 ; LF: 証左

A ship got into the port slowly.
（一つの船が，静かな港にゆっくりと入ってきた。）
Focus: ship; non-focus: port; HF: 一つ ; LF: 一隻

What was the *reason* that the Japanese developed the kimono?
（どのような*理由*から日本人は和服を発明したのだろうか。）
Focus: kimono; non-focus: developed; HF: 理由 ; LF: 素因

In the construct of my house, the *overall* central focus is the living room.
（我が家の構図のいわば*全体的*な中心が居間である。）
Focus: living room; non-focus: construct; HF: 全体的 ; LF: 中空的

My sister's Haiku was not a part of my behavior or *sensations*.
（姉の作った俳句は，私の挙動でも*感動*でもなかった。）
Focus: Haiku; non-focus: sister; HF: 感動 ; LF: 感懐

Actually, laziness with hate and *anguish* was all about my brother.
（実は，*苦痛*をいとう怠惰が兄の全てだったのだ。）
Focus: laziness; non-focus: all; HF: 苦痛 ; LF: 刻苦

Because my sandal *strap* was broken, I asked for help.
（サンダルのひもが切れたので近くの人に助けを求めた。）
Focus: help; non-focus: sandal; HF: ひも ; LF: 鼻緒

It revealed a heavy deficit when I *summed* expenses for the current month.
（今月の出費を*合計*したら，大幅な赤字になってしまった。）
Focus: deficit; non-focus: expenses; HF: 合計 ; LF: 合算

She made an effort because she felt ashamed of her *knowledge*.
（自分の*知識*に恥じた彼女は，さまざまな努力をした。）
Focus: effort; non-focus: she; HF: 知識 ; LF: 浅学

Croft, which had been *reclaimed*, has gone on to library.
（かつて*開発*された畑も今は図書館になってしまった。）
Focus: library; non-focus: Croft; HF: 開発 ; LF: 開墾

It is neither duress nor a *nonsense* homily but moral.
（これは脅しでも*無意味*な説教でもなく，教訓である。）
Focus: moral; non-focus: duress; HF: 無意味 ; LF: 空疎

The children heard a lullaby with *sadness*.
（子どもたちは*悲しみ*をおびた子守歌を聞かされた。）
Focus: lullaby; non-focus: children; HF: 悲しみ ; LF: 哀調

Again, animosity is engraved in the heart with *regret*.
（再び憎悪が，*後悔*と一緒に心へ入ってきた。）
Focus: animosity; non-focus: heart; HF: 後悔 ; LF: 侮蔑

Household accounts, which were *accurately* filled out by the homemaker, were in our hands.
（主婦によって*正確*に記入された家計簿が手元にある。）
Focus: household accounts; non-focus: hands; HF: 正確 ; LF: 克明

There is only coarse and *simple* information which be directed from oneself to other.
（自分から相手へ向かうだけの粗末で*簡単*な情報しかない。）
Focus: information; non-focus: coarse; HF: 簡単 ; LF: 尊大

Human values are based on not on the *exterior* or sex but on the inner face.
（人間の価値は*外見*や性別ではなく，その内面である。）
Focus: inner face; non-focus: values; HF: 外見 ; LF: 美醜

She is recognized as the leading expert on the *development* of Haiku.
（彼女は俳句の*発展*を導いた第一人者と呼ばれている。）
Focus: expert; non-focus: Haiku; HF: 発展 ; LF: 隆盛

Americans did not overlook the fact *in front of* them.
（アメリカ人は，*目の前*の事実を見過ごすことはなかった。）
Focus: Americans; non-focus: fact; HF: 目の前 ; LF: 眼前

Because of fear and curiosity, I could only breathe *for a while*.
（恐怖と好奇心からか，*しばらく*は呼吸しかできなかった。）
Focus: breathe; non-focus: fear; HF: しばらく ; LF: 暫時

The fact that he was absent acts as an *important* clue for the solution.
（彼がいなかったことが，解決の*大切*な手がかりとなった。）
Focus: clue; non-focus: solution; HF: 大切 ; LF: 好個

The man realized that her answer was *unexpectedly* banal.
（その男は，彼女の答えが*意外と*，平凡なのに気が付いた。）
Focus: banal; non-focus: answer; HF: 意外と ; LF: 存外

The woman to whom I mailed a *letter* was a surprisingly beautiful girl.
（僕が*手紙*を送りつけたのはとんでもない美女だった。）
Focus: beautiful girl; non-focus: I; HF: 手紙 ; LF: 艶書

Nature has been urbanized; therefore has been repeatedly changed and *broken*.
（自然は都市化してしまい，変化や*崩壊*を繰り返している。）
Focus: urbanized; non-focus: changing; HF: 崩壊 ; LF: 自壊

The treaty to protect endangered animal species was *ratified*.
（絶滅の危機にある動物を守るため，条約が*実行*された。）
Focus: treaty; non-focus: endangered; HF: 実行 ; LF: 批准

She watched the sleeping face of her friend taking a *nap*.
（彼女は*昼寝*している友人の寝顔をのぞきこんだ。）
Focus: sleeping face; non-focus: friend; HF: 昼寝 ; LF: 仰臥

A hunting lifestyle is more affluent than a *farmer's* life.
（狩猟の生活は*農民*の暮らしよりもずっと豊かである。）
Focus: affluent; non-focus: lifestyle; HF: 農民 ; LF: 農奴

When we hope for cruel and *unrequited* relations, they come with difficulty.
（残酷で*一方的*な関係を望むとき，困難が訪れる。）
Focus: difficulty; non-focus: relations; HF: 一方的 ; LF: 主我的

The context, which *amplifies* each scene, is unique.
（個々の場面を*展開*する文脈は，独自のものである。）
Focus: unique; non-focus: context; HF: 展開 ; LF: 包摂

Massage, which has come down inaccurately, has been mistaken.
（やや不正確な*言葉*が伝わったため，勘違いされている。）
Focus: mistaken; non-focus: inaccurately; HF: 言葉 ; LF: 口碑

A feature of this *cup* is the varied designs.
（この*茶碗*の特徴のひとつは，様々な模様である。）
Focus: design; non-focus: features; HF: 茶碗 ; LF: 縄文土器

Governments make budgets with various *taxes* in mind.
（さまざまな*税金*を考えに入れて政府は予算を組む。）
Focus: budgets; non-focus: governments; HF: 税金 ; LF: 租税

On a hot summer day, we plunged into the *blue* sea to get some cool.
（夏の暑い日に*青色*の海に入り，涼しさを求めた。）
Focus: cool; non-focus: summer; HF: 青色 ; LF: 紺碧

Insects, which *move* pollen, play an important role.
（花粉を*移動*する虫の重要性は相当なものです。）
Focus: insects; non-focus: important; HF: 移動 ; LF: 媒介

We need a sensibility to *understand* this artifact.
（私達は人工物すら*理解*できる感性が必要だろう。）
Focus: sensibility; non-focus: artifact; HF: 理解 ; LF: 交感

To buy a television with a *loan* has negative consequences for life.
（テレビを*ローン*で買うことで生活に悪影響が出る。）
Focus: negative consequences; non-focus: television; HF: ローン ; LF: 月賦

He was a poet who could absorb every hard *situation*.
（彼はどんなに苦しい*状況*にでも耐えられる詩人だった。）
Focus: poet; non-focus: hard; HF: 状況 ; LF: 境涯

This room did not have an independent space for *conversation*.
（この部屋には独立しながら，*会話*するための間がない。）
Focus: space; non-focus: conversation; HF: 会話 ; LF: 和合

These novels included in this book are *picked up* from diaries.
（この本に*収録*されている小説は，日記を集めたものである。）
Focus: diary; non-focus: novels; HF: 収録 ; LF: 採録

My sister has addictive *characteristic*, which requires satisfaction.
（妹には自分の満足を求める，熱狂的な*性格*がある。）
Focus: addictive; non-focus: own; HF: 性格 ; LF: 性向