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Abstract

This study examined how *seductive details*, interesting but unimportant text information, influenced expository text comprehension of Japanese EFL learners. Whereas inserting seductive details originally aims to motivate learners to read complicated expository texts, past L1 studies suggest that such information distracts their attention from the main ideas of the text. In this study, 123 Japanese university students read an expository text either with or without seductive details (the +SD vs. the –SD condition), and then completed immediate and one-week-delayed recall tasks. The results of the recall tasks showed that the learners' attention was strongly drawn to the seductive details, regardless of their English reading proficiency. However, the seductive details did not hinder the learners' comprehension of the base text and main ideas. While the seductive details did not affect the quantity of text comprehension, detailed comparisons showed that they influenced what the learners remembered from the text. These findings suggest that seductive details do not always work negatively in expository reading, and the relationships between seductive details and surrounding contexts are closely relevant to whether seductive details have positive or negative effects.

1. Background

The primary objective of expository reading is to learn unfamiliar information, such as ideas and relationships on technical matters, from texts (Coté, Goldman, & Saul, 1998; Wolfe & Woodwyk, 2010). To achieve deep comprehension of expository texts, readers have to integrate

the main ideas in the texts into their mental representations (e.g., Beishuizen, Asscher, Prinsen, & Elshout-Mohr, 2003; Ushiro, Nakagawa, Kai, Watanabe, & Shimizu, 2008). Generally, narrative texts provide concrete information such as characters, settings, and events, whereas the main ideas in expository texts represent abstract concepts (e.g., Beishuizen et al., 2003; Sadoski, 2001). This feature makes expository texts more complex to understand than narrative texts (Sadoski, 2001; Wolfe & Woodwyk, 2010). Let us consider the following expository text that describes how zero gravity in space affects the human body:

> The human body is a complex system that automatically responds to the lack of gravity. While in space, the body is not affected by gravity. Therefore, blood and water do not travel to the lower parts of the body, especially the legs. In fact, the blood and water within the body move to the upper body. (adapted from Peshkam, Mensink, Putnam, & Rapp, 2011)

Although this passage coherently explains some scientific phenomena, the ideas expressed in it are so abstract that readers may have difficulty building a concrete mental representation.

To mitigate the difficulty of comprehending expository texts, prior reading research in first language (L1) examined effects of inserting interesting information called *seductive details* into the original *base text* illustrated above (e.g., Garner, Gillingham, & White, 1989; Harp & Mayer, 1998; Lehman, Schraw, McCrudden, & Hartley, 2007; Peshkam et al., 2011; Schraw, 1998; Wade, Schraw, Buxton, & Hayes, 1993). Seductive details are defined as segments that are "highly interesting, but unimportant or irrelevant to the text's main ideas. These segments usually contain information that is tangential to the main ideas" (Lehman et al., 2007, p. 570). Prior studies assumed that seductive details evoked readers' interest in the contents of the texts and motivation to read them, leading to better comprehension and learning from the text (Harp & Mayer, 1997; Sadoski, 2001; Wade, 2001). For example, the following information can be inserted as a seductive detail into the base text above:

> Space travelers' faces look bigger due to large amounts of water in the upper body. However, their legs become much smaller because there is less water in the lower body. Some space travelers like to wear baseball hats, but the hat must be larger than the size worn on Earth. (adapted from Peshkam et al., 2011)

Given that seductive details are a subcategory of supporting details, they should play positive roles in text comprehension. An important role of details is to make abstract texts more concrete and elaborative. Taniguchi (1999) examined effects of inserting example information, which is familiar to L1 readers, as supporting details in the text. The results demonstrated that such details improved the activation of readers' background knowledge and the construction of concrete mental image of the text, which prompted the readers' retention of text contents. Thus,

making texts concrete and elaborative by details will help close the gap between the unfamiliar text contents and readers' prior knowledge (e.g., Beishuizen et al., 2003; Taniguchi, 1999).

However, some previous studies indicated that seductive details have negative effects on reading comprehension. It has been suggested that (a) readers would pay more attention to seductive details than to the main ideas and (b) whole text comprehension would be hindered by seductive details. First, many studies revealed that L1 readers recalled more seductive details than other text information in a written recall task (Harp & Mayer, 1997; Peshkam et al., 2011; Schraw, 1998; Wade et al., 1993). This result suggests that seductive details drew so much of the readers' attention that they failed to allocate their cognitive resources fully to the other part, even to the main ideas of the text (e.g., Harp & Mayer, 1998). As a result, they constructed mental representations with a focus on the seductive details (e.g., Lehman et al., 2007). Second, the insertion of seductive details might prevent readers from comprehending the other text information (Garner et al., 1989; Harp & Mayer, 1997, 1998; Lehman et al., 2007). In Lehman et al. (2007), for example, the L1 readers who read the base text with seductive details recalled less of the base text information than those who read only the base text. They discussed the possibility that such negative effects of seductive details might occur when transitioning from the seductive details to the text's main topic (i.e., the topic shift) disrupted readers' processing of the base text.

Although some studies replicated such negative effects of seductive details, other studies have argued that seductive details do not interfere with comprehending the base text. For example, Garner and Gillingham (1991) and Schraw (1998) demonstrated that base text retention did not significantly differ between the readers who read the text with seductive details and those who read only the base text. More importantly, Rey (2012) synthesized prior research results using meta-analysis, and revealed that the negative effects of seductive details were small on a retention task such as recall (Cohen's $d = 0.27$). According to the results of the meta-analysis, the reading and recall task without time limit may reduce such negative effects of seductive details. It is assumed that when readers have enough time to read a text, they can devote their cognitive resources to the base text and main ideas as well as seductive details. In such case, seductive details do not appear to hinder the comprehension of main ideas and base text.

There are few studies that examined the effects of seductive details on expository text comprehension in English as a foreign language (EFL). However, Miller and Keenan (2011) pointed out that limited reading proficiency prevented the EFL learners from preferentially allocating more attentional resources to the main ideas, which hindered the comprehension of the central text information. Accordingly, EFL learners, whose English reading proficiency is more limited than that of L1 readers, may receive a negative influence from seductive details. On the other hand, high-proficiency EFL learners (e.g., undergraduate level) can identify the main ideas in the text and include them in recall or summary protocols (Kim, 2001; Ushiro et al., 2007, 2008). These studies imply the possibility that the effects of seductive details are not salient.

In summary, (a) past studies have revealed that L1 readers paid more attention to seductive details than to the main ideas, but (b) past studies have not reached agreement on whether seductive details hinder comprehension of base text and main ideas. Regarding (a) and (b), this study examined the effects of seductive details in EFL reading from the same perspectives as the previous studies (Research Questions [RQs] 1 and 2). In addition, this study expands the findings of the past studies. First, this study implemented a one-week-delayed recall task, which allows us to examine how seductive details and the other information are encoded into long-term memory. Second, the past studies focused only on the effects of seductive details on the total recall produced in the recall tasks, and did not consider which text information was retained in the readers' memory representations. In this study, we tested whether or not the mental representation constructed by learners differ between texts with and without seductive details through detailed comparisons of recall protocols, and discussed why seductive details might have this influence, based on discussion in previous studies (RQ3). These three RQs are summarized as follows:

RQ1: Do Japanese EFL learners recall seductive details rather than the main ideas?
RQ2: Do seductive details reduce the recall production of the base text and main ideas?
RQ3: Do seductive details influence the text information recalled?

2. Method

2.1 Participants

Participants were 140 Japanese undergraduates recruited from two universities. However, 17 participants' data were removed because they were absent from some experimental sessions. Thus, the data from 123 participants were available for full analyses. Most of them had received English education for more than six years in Japan, and their English proficiency level was diverse (i.e., A2 to B2 level in Common European Framework of Reference for Languages) based on their self-report. Their majors were medicine, nursing, sociology, international relations, or economics. They were randomly divided into two reading conditions: the base text plus seductive details (+SD condition) or the base text only (–SD condition).

This study assumed that the ability of reading discourses in English related to the effects of seductive details; the reading subsection in the Eiken test (Obunsha, 2005a, 2005b) was implemented to divide them into three English reading proficiency groups. The proficiency test included the pre-first ($k = 8$) and second grade ($k = 20$) in the Eiken test (Cronbach's $\alpha = .90$). A 2 (Text: +SD and –SD) × 3 (Proficiency: Upper, Middle, and Lower) analysis of variance (ANOVA) was used to ensure that the participants' English reading proficiency levels (a) did not differ between the ±SD conditions, and (b) significantly differ among the three groups. The results showed a significant main effect of Proficiency, $F(2, 117) = 423.09$, $p < .001$, $\eta^2 = .86$. In contrast, the main effect of Text was not significant, $F(1, 117) = 1.13$, $p = .290$, $\eta^2 < .01$, and did not

interact with Proficiency, $F(2, 117) = 1.50$, $p = .227$, $\eta^2 < .01$. Multiple comparisons with Bonferroni correction showed that the three proficiency levels were statistically different (Upper vs. Middle: $p < .001$, $M_{diff} = 5.79$, 95% CI [4.57, 7.01]; Middle vs. Lower: $p < .001$, $M_{diff} = 8.96$, 95% CI [7.74, 10.17]). Table 1 shows the results of the reading proficiency test.

Table 1

Means With 95% CIs and Standard Deviations of the English Reading Proficiency Test Results

	+SD condition				–SD condition			
Proficiency	*n*	*M*	95% CI	*SD*	*n*	*M*	95% CI	*SD*
Upper	16	21.75	[20.43, 23.07]	2.70	24	21.54	[20.65, 22.43]	2.23
Middle	24	15.71	[14.92, 16.50]	1.97	18	16.00	[15.19, 16.81]	1.75
Lower	19	7.63	[6.60, 8.66]	2.29	22	6.23	[5.13, 7.33]	2.64
Total	59	14.75	[13.23, 16.27]	5.96	64	14.72	[13.02, 16.42]	6.95

2.2 Materials

This study prepared two versions of expository texts (the ±SD texts) through two pilot studies. The first pilot study intended to select a text with (a) less familiar topic and (b) appropriate difficulty level. In the second pilot study, (c) the validity of the seductive details was verified and (d) the main ideas in the base text were identified.

Prior to the pilot studies, four expository passages including seductive details were collected from past studies. "Heart" and "Kidney" were adapted from Peshkam et al. (2011), "Lightning" from Harp and Mayer (1998), and "Star" from Johnston (2002). These passages were simplified for Japanese EFL learners by replacing low-frequency words (Level 5 and over) with high-frequency synonyms (Level 4 and below) based on *the JACET 8000 List* (JACET, 2003) or providing glosses in Japanese. In addition, we shortened the texts to about 300 words with the help of a native speaker of English. The proportion of seductive details (the number of words in the seductive details/the total number of words in the text) in each text was kept at approximately 25% based on Rey's (2012) meta-analysis.

2.2.1 Pilot study 1: Selection of the experimental passage

To select the suitable passage for achieving our research goals, the rating data of topic familiarity and text difficulty were collected. Participants were 22 Japanese undergraduates and graduates, who did not take part in the experiment; they were randomly assigned to either the +SD ($n = 12$) or the –SD condition ($n = 10$). After reading each text, they rated its text difficulty (1. *easy*, to 5. *difficult*) and topic familiarity (1. *not familiar at all*, to 5. *very familiar*). On the basis of the results, we finally selected "Heart" as the experimental passage because the difficulty was suitable ($M = 2.33$, $SD = 0.49$ for the +SD text; and $M = 2.20$, $SD = 0.79$ for the –SD text) and the familiarity was relatively low for the participants ($M = 1.08$, $SD = 0.29$ for the +SD text; and $M = 1.70$, $SD = 0.68$ for the –SD text).

The original passage of "Heart" was adapted from "Space Travel" used in Peshkam et al. (2011). This passage described various effects of zero gravity on the human body; it also included three seductive details that we inserted in three different places at a relatively constant textual distance from each other. Unknown words reported in the first pilot study were paraphrased again. For the three words (i.e., *chest*, *lung*, and *eliminate*), which might make reading difficult, glosses were presented in Japanese. After the text modification, the –SD text contained 269 words in 15 sentences (Flesch-Kincaid Grade Level [FKGL] = 8.9, Flesh Reading Ease [FRE] = 62.8). In the +SD text, 83 words in five sentences were added as seductive details to the –SD text. Therefore, the +SD text consisted of 352 words in 20 sentences (FKGL = 8.7, FRE = 63.7). The proportion of the seductive details was 24% of the whole text. The final version of the experimental passage is shown in Appendix.

2.2.2 Pilot study 2: Verification of seductive details and main ideas

In the second pilot study, to ensure that the five sentences inserted as the seductive details were indeed interesting but less important to Japanese EFL learners, 10 Japanese graduates majoring in English education rated the importance and interest of the text information. None of them joined in any other experiments. They rated the importance (1. *not important*, to 5. *important*) and interest (1. *not interesting*, to 5. *interesting*) of each sentence in the +SD text. Following the criterion of past studies (e.g., Lehman et al., 2007; Wade et al., 1993), we calculated the overall degree of the importance ($M = 3.31$, $SD = 1.08$, Median = 3.80), and interest ($M = 3.46$, $SD = 0.65$, Median = 3.40). Then, the sentences that were less important and more interesting than the median were defined as seductive details. The results showed that all the seductive details used in this study (see Appendix) satisfied the criterion (importance: 1.68, interest: 4.42 on average).

Finally, we identified the main ideas in the base text. Two raters determined whether or not each sentence was a main idea in the text. Inter-rater agreement was 89%, and any discrepancies were resolved through discussion. Finally, seven sentences were regarded as the main ideas.

2.3 Procedure

The experiment had the following two sessions: (a) the immediate session, where the text was read and a written recall task was completed, and (b) the subsequent session following a one-week delay, where the same recall task and an English reading proficiency test were completed. In the immediate session, the experimenters randomly distributed either a +SD or a –SD text to each participant, gave a general explanation of the experiment's purpose, and obtained informed consent. The participants were told that they would answer questions about the passage, but they were not informed about the immediate and delayed recall tasks in advance. There was no time limit, but all the participants finished reading the whole passage within 10 minutes, according to their self-report. Immediately after the reading, they wrote down, in Japanese, everything they could comprehend from the text. It took 15 minutes to finish the immediate recall

task. In the delayed session, the participants were asked to recall what they remembered about the text they had read the week before. The task lasted for 12 minutes. Finally, the 30-minute English reading proficiency test was conducted.

2.4 Scoring

Before assessing the recall protocols, two raters independently parsed the experimental passage into idea units (IUs) on the basis of Varnhagen (1991). Each IU consisted of one predicate proposition including one verb. The inter-rater agreement rate was 99%. All disagreements were resolved through discussion. The number of IUs was 46 in the +SD text (including the 13 IUs as seductive details) and 33 in the –SD text.

In the scoring of the recall protocols, one point was given when each IU was reproduced. Four pairs of eight raters scored 30% of the total number of protocols. The inter-rater agreement rates of the pairs were 92% on average. Any discrepancies were resolved through discussion. After the scoring criteria were shared with the raters, the same protocols were scored again. According to the revised criteria, the eight raters scored the remaining protocols independently.

3. Results and Discussion

Table 2 shows the mean recall production rates for the base text, main ideas, and seductive details in the immediate and delayed recall tasks. To answer the three RQs, the following quantitative and qualitative analyses were conducted on the recall production rates.

Table 2

Descriptive Statistics of Recall Production Rate

		Immediate recall						Delayed recall					
		Base		Main		Seductive		Base		Main		Seductive	
Proficiency	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
						+SD condition							
Upper	16	.50	.13	.49	.13	.73	.12	.42	.12	.43	.13	.65	.17
Middle	24	.40	.15	.35	.19	.64	.18	.28	.10	.22	.11	.45	.20
Lower	19	.22	.14	.21	.16	.41	.28	.15	.11	.12	.10	.31	.29
Total	59	.37	.18	.34	.20	.59	.24	.28	.15	.25	.17	.46	.25
						–SD condition							
Upper	24	.49	.15	.45	.19	NA	NA	.36	.16	.33	.20	NA	NA
Middle	18	.46	.11	.42	.16	NA	NA	.30	.15	.26	.20	NA	NA
Lower	22	.22	.14	.16	.12	NA	NA	.18	.13	.12	.11	NA	NA
Total	64	.39	.18	.34	.21	NA	NA	.28	.17	.24	.20	NA	NA

Note. Base = base text; Main = main ideas; Seductive = seductive details. Base text includes the main ideas and other information without the seductive details. Cronbach's α = .88 for the immediate, and α =.87 for the delayed recall in the +SD condition; α = .84 for the immediate, and α =.83 for the delayed task in the –SD condition. NA = not applicable.

The first analysis focused on whether more seductive details were recalled than main ideas by comparing the recall rates between the main ideas and seductive details in the +SD condition (RQ1). To determine if the seductive details had negative influence on comprehension of the base text and main ideas, the second analysis directly compared the recall rates of the base text and main ideas between the ±SD conditions (RQ2). These analyses provide quantitative results about the effects of seductive details on text comprehension; however, they do not necessarily reflect what information is included in the learners' mental representations. Therefore, we qualitatively compared each IU's production between the ±SD conditions (RQ3).

3.1 Recall Production of Seductive Details and Main Ideas (RQ1)

Figure 1 illustrates the immediate and delayed recall production rates of the main ideas and seductive details in the +SD condition. Obviously, the unimportant seductive details were recalled twice as much as the main ideas. To support this observation, a three-factor mixed ANOVA was conducted on the recall rates as a dependent variable; the between-participants variable was Proficiency (Upper, Middle, and Lower), and the within-participants variables were Information (Main ideas and Seductive details) and Recall (Immediate and Delayed). Before this analysis, arcsine transformation was performed on the recall rates for the main ideas and seductive details, because the number of IUs differed between the two information types.

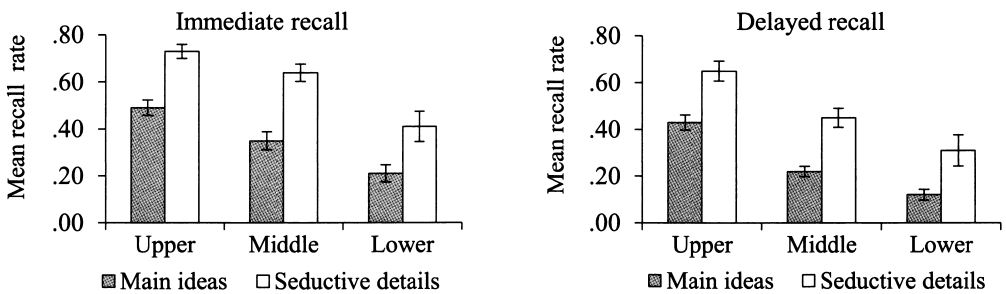

Figure 1. Mean recall rates (±*SEM* bars) of the main ideas and seductive details in the +SD condition.

The overall results of the ANOVA are shown in Table 3. All the main effects were significant; however, no interactions among these factors were found. These results demonstrated that (a) the seductive details were recalled rather than the main ideas and (b) such recall patterns did not differ according to the learners' English reading proficiency or memory decay (i.e., immediate vs. delayed recall). In the previous studies, EFL learners reproduced more main ideas than details in normal expository texts, which did not include seductive details (Kim, 2001; Ushiro et al., 2007, 2008); in this study, however, the seductive details attracted the participants' attention, resulting in the poorer retention of the main ideas compared to the seductive details. In other

words, these seductive details were strongly encoded into the EFL learners' long-term memory. Moreover, even the higher-proficiency EFL learners paid more attention to the seductive details than to the main ideas. This tendency is consistent with many L1 studies (e.g., Garner et al., 1989; Peshkam et al., 2011; Schraw, 1998; Wade et al., 1993).

Table 3

Summary Table for the ANOVA on Recall Performance in the +SD Condition (RQ1)

Source	*SS*	*df*	*MS*	*F*	*p*	η^2
			Between participants			
Proficiency (P)	15494.15	2	7747.07	19.75	< .001	.57
Error (P)	21968.31	56	392.29			
			Within participants			
Recall (R)	2749.39	1	2749.39	59.25	< .001	.10
R × P	274.84	2	137.42	2.96	.060	.01
Error (R)	2598.82	56	46.41			
Information (I)	8778.87	1	8778.87	61.58	< .001	.33
I × P	108.11	2	54.05	0.38	.686	.00
Error (I)	7983.09	56	142.56			
R × I	76.89	1	76.89	2.14	.149	.00
R × I × P	77.26	2	38.63	1.08	.348	.00
Error (R × I)	2010.91	56	35.91			

3.2 Recall Production of Base Text and Main Ideas (RQ2)

Figure 2 shows the mean production rates of the base text and main ideas in the ±SD conditions. This study separately used two three-factor mixed ANOVAs on the total recall production of the base text and main ideas as dependent variables because these recall rates were strongly correlated in the immediate task (r = .89, p < .001) and in the delayed task (r = .88, p < .001). The between-participants variables were Text (+SD and –SD) and Proficiency (Upper, Middle, and Lower), and the within-participants variable was Recall (Immediate and Delayed).

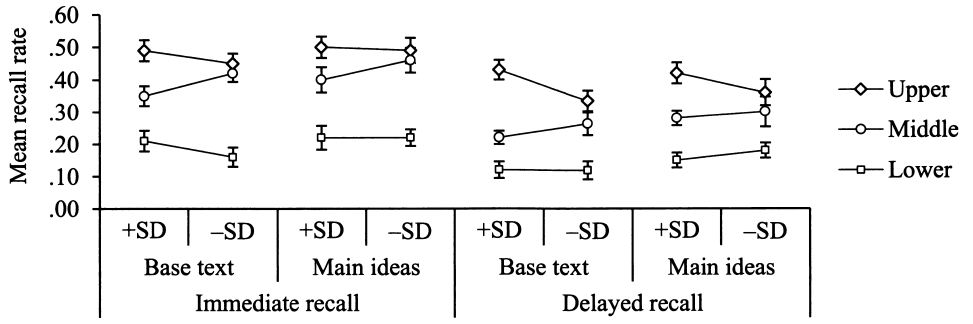

Figure 2. Mean recall rates (±*SEM* bars) of the main ideas and base text in the ±SD conditions.

The overall results of the ANOVAs are shown in Table 4. The significant main effects of Proficiency and Recall were found in the base text and main ideas. However, the main effect of Text was not significant either in the base text, or in the main ideas. In addition, no interactions between Text and the other factors were found. In other words, the recall rates of the base text and main ideas did not differ between the ±SD conditions regardless of the English reading proficiency and recall time.

Table 4

Summary Table for the ANOVAs on the Base Text and Main Idea Recall Production (RQ2)

	Base text						Main ideas					
Source	*SS*	*df*	*MS*	*F*	*p*	η^2	*SS*	*df*	*MS*	*F*	*p*	η^2
Between participants												
Text (T)	0.01	1	0.01	0.18	.671	.00	0.01	1	0.01	0.22	.641	.00
Proficiency (P)	2.56	2	1.28	42.22	< .001	.81	3.03	2	1.51	38.08	< .001	.83
T × P	0.06	2	0.03	0.98	.377	.02	0.17	2	0.08	2.10	.127	.05
Error	3.55	117	0.03				4.65	117	0.04			
Within participants												
Recall (R)	0.59	1	0.59	107.61	< .001	.19	0.60	1	0.60	67.10	< .001	.17
R × T	0.01	1	0.01	1.40	.239	.00	0.00	1	0.00	0.36	.547	.00
R × P	0.07	2	0.03	6.05	.003	.02	0.07	2	0.03	3.80	.025	.02
R × T × P	0.02	2	0.01	1.90	.154	.01	0.03	2	0.01	1.56	.215	.01
Error (R)	0.64	117	0.01				1.05	117	0.01			

The results showed that the insertion of the seductive details did not prevent the EFL learners from retaining the base text and main ideas (RQ2). This finding is consistent with some L1 studies reporting the null effects of seductive details (Garner & Gillingham, 1991; Schraw, 1998). Although the seductive details did surely attract the readers' attention (RQ1), the result suggests that the learners in the +SD condition paid a similar amount of attention to the base text and main ideas to those in the –SD condition. The reason for this similarity in the amount of attention can be attributed to the substantial reading time. The present study did not set a time limit for the reading in order that the participants could read the whole text, which led to similar mental representations in terms of the recall production quantity regardless of the insertion of seductive details. This result accords with the claim that no time limit in reading or post-reading tasks moderates the effects of seductive details (Rey, 2012).

However, the quantitative data of the recall protocols has potential limitations because it did not provide evidence of what text information was recalled per participant. Although the recall rates did not quantitatively differ between the ±SD conditions, this data was unable to provide insight into the qualitative details of the information retained in text representation between the two conditions. Therefore, the qualitative differences in the recall protocols between the ±SD conditions should be more carefully examined by analyzing each IU's recall production.

3.3 Detailed Comparison Between the ±SD Conditions (RQ3)

The final analysis compared the ±SD conditions focusing on the production of each IU in the delayed recall task to determine if the insertion of seductive details affected the establishment of text memory, and if so, in what way. It should be noted that the analysis was carried out only for the delayed recall protocols, not for the immediate ones, in order to examine what information was encoded into learners' long-term memory.

First, the number of participants who had recalled each IU was counted, and cross-tabulations were created to examine the effects of Text on the production of each IU. After verifying that the expected values in all the cells were above five, two-way chi-square tests were conducted on each IU. The results showed that the number of participants who recalled IU10, IU34, and IU35 were significantly related to the Text factor (see Table 5). Specifically, whereas IU10 was better recalled in the +SD than in the –SD condition, IU34 and IU35 were better recalled in the –SD than in the +SD condition. These results suggested that although the participants understood almost the same quantity of ideas from the base text irrespective of the condition, what information was encoded into their memory was likely to partially differ between the ±SD conditions. The following discussion is about how and why these differences arose.

Table 5

The Results of Chi-Square Tests for Recall Frequency of Each IU

IU	Statements	+SD ($n = 59$)		–SD ($n = 64$)	$\chi^2(1)$	p
10	In fact, the blood and water within the body move to the upper body.	48	>	38	7.05	.008
34	it becomes more difficult for the human body	4	<	14	5.60	.018
35	to work normally	4	<	13	4.72	.030

All the IUs shown in Table 5 were surrounded by the seductive details (see also Appendix), indicating that the effects of seductive details were found only locally rather than globally. Given that the seductive details were strongly encoded into the participants' memory in the +SD condition (RQ1), it was predicted that whereas the information tightly connected with the seductive details would be retained in their memory, weakly connected information would fade out. To examine this possibility, we examined the relationships between the seductive details and surrounding contexts based on (a) co-occurrence of information and (b) the discussions in the previous studies.

In relation to the positive effects of details, the second seductive detail facilitated the recall production of surrounding information (IU10). Specifically, among 46 participants who recalled the second seductive detail, 40 participants (87%) also recalled IU10. The higher co-occurrence in their recall protocols can be attributed to "the elaboration role of details," such as making abstract text concrete and elaborative (e.g., Taniguchi, 1999). Whereas IU10 itself is assumed to be an

abstract and difficult concept to comprehend, the seductive detail elaborated it and evoked a concrete mental image in the +SD condition. For example, one participant in the +SD condition recalled the information as follows: "Even when the baseball hat suits him on Earth, he can't wear the hat in space because his head becomes larger. The reason why the head becomes larger was that a lot of blood and water within the body move to the upper body" (translated into English). This example illustrates that this learner in the +SD condition constructed mental representations with a focus on the seductive details rather than the main ideas; consequently, the learner recalled the base text information based on the seductive details. This indicates that the strongly encoded seductive details must have helped retrieve related IU10 from the learner's long-term memory.

For the negative effects, the third seductive detail hindered the recall production of the adjacent information (IU34 and IU35) in the +SD condition. Among the participants who included this seductive detail in their delayed recall protocols, only one participant (3%) recalled both IU34 and IU35 together. Previous studies demonstrated that a drop of recall production might occur when seductive details cause transitioning from seductive details to the subsequent text information (e.g., Lehman et al., 2007). The third seductive detail (underlined) and surrounding context in the +SD text are as follows:

> The water level in their bodies becomes less than normal because the body water is eliminated and they do not feel thirsty. It is not surprising that a monkey was happy to get a water-rich apple after returning from space. When the amount of blood and water decreases, **it becomes more difficult for the human body to work normally** (IU34 and IU35 in boldface).

While the two sentences of the base text describe the main topic of zero gravity effects on the human body, the seductive detail between them introduces an episode about the monkey. Thus, the seductive detail distracted the readers' attention from the main topic and made it difficult for them to coherently integrate the subsequent text information, especially IU34 and IU35. This transition made the connection between the seductive detail and the following information weaker; consequently, the participants in the +SD condition were more likely to miss out IU34 and IU35 in their recall protocols than those in the –SD condition.

Although the first seductive detail (i.e., *Thus, monkeys, who have similar body systems to humans, were the first travelers in space*) also introduced an episode with the monkey like the third seductive detail, it did not affect the recall production of IUs alongside it. Focusing on the disruption of text coherence, the transition between the seductive detail and its preceding information was maintained by the discourse marker *thus*. Moreover, given that the seductive detail and the subsequent text information crossed the border of Paragraphs 1 and 2, the semantic unit of Paragraph 1 ended regardless of the insertion of this seductive detail. It follows that this seductive detail did not disrupt comprehension of the subsequent information. Similarly, the first

seductive detail has no role in elaborating the previous text information. Thus, the first seductive detail did not satisfy the conditions where either negative or positive effects of seductive details occur, resulting in the null effects on the surrounding context.

In summary, detailed comparisons between the ±SD conditions showed that seductive details influenced what information was encoded into the learners' mental representations (RQ3). Furthermore, it was demonstrated that the local effects of seductive details may be either positive or negative, depending on what kind of relationship the seductive details have with the surrounding context. These results have theoretical implications in differentiating the potential negative and positive effects of seductive details on text comprehension.

4. Conclusion

The present study investigated the effects of seductive details on expository text comprehension among Japanese EFL learners. The quantitative and qualitative analyses allowed us to examine the effects of seductive details on readers' mental representations in detail. The main findings of this study can be summarized as follows. First, although the main ideas are essentially the important elements in expository texts, the EFL learners retained the seductive details much better than the main ideas. These results suggested that the learners' attention was strongly drawn by the seductive details (RQ1); therefore, one might wonder if perhaps teachers should remove all of the seductive details from reading passages. However, the attention drawn by the seductive details did not hinder the learners' comprehension of the base text and main ideas (RQ2). It was demonstrated that the readers were able to comprehend and retain the main ideas even when their attention was drawn to the seductive details. In addition, the qualitative analyses showed that the seductive details affected what the learners remembered from the text. Specifically, the seductive details influenced the readers' text memory at a local level in both a positive and a negative way, depending on the contextual relationships with the surrounding information (RQ3). Taken together, these conclusions show that seductive details can play their intended role as activators of interest and background knowledge if inserted appropriately, leading to better comprehension of expository texts.

This study has pedagogical implications for how to make the most of seductive details in reading instruction. Detailed analyses of the relationship between seductive details and surrounding contexts showed that the types of seductive details determined whether they inhibited or facilitated expository comprehension. Therefore, teachers need to consider whether certain seductive details in the texts that they use will have a positive or a negative effect on their students' reading. If it seems difficult for the learners to understand the transition from certain seductive details to the base text, discourse markers or questions asking about the relationships between the text before the seductive details and its continuation after the seductive details might assist their understanding. On the other hand, when the seductive details are likely to elaborate the other

information in the text, the learners can use them as retrieval cues in post-reading tasks. For example, presenting seductive details as a cue for retelling tasks would enable learners to retrieve related information and to reconstruct the story with a more sophisticated image.

The present study is only the first step in examining the effects of seductive details on EFL reading; further experimental and practical research is needed. The present study targeted only university students who are proficient enough to identify the main ideas in a text (Ushiro et al., 2008). If the participants were less proficient, the same seductive details may cause negative effects on their text comprehension. Moreover, how much of the learners' attention is drawn to seductive details, and whether or not learners suppress seductive details in reading comprehension, may be more closely examined using on-line data collection methods (e.g., self-paced reading and eye-tracking studies) and other off-line tasks (e.g., a summary writing task), than was possible in this study.

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Appendix

The Experimental Passage in the +SD Condition

When people first considered space travel, they did not know how the zero gravity of space would affect humans. Thus, monkeys, who have similar body systems to humans, were the first travelers in space.

The human body is a complex system that automatically responds to the lack of gravity. While in space, the body is not affected by gravity. Therefore, blood and water do not travel to the lower parts of the body, especially the legs. In fact, the blood and water within the body move to the upper body. This leads to some interesting effects. Space travelers' faces look bigger due to large amounts of water in the upper body. However, their legs become much smaller because there is less water in the lower body. Some space travelers like to wear baseball hats, but the hat must be larger than the size worn on Earth.

Because blood and water travel to the upper parts of the body, the body feels like the chest and head are filled with blood and water. Some parts of the body, such as the lungs and heart, send messages that the amount of blood and water must be reduced in the upper part of the body. Space travelers do not feel thirsty, and therefore drink less water. The water level in their bodies becomes less than normal because the body water is eliminated and they do not feel thirsty. It is not surprising that a monkey was happy to get a water-rich apple after returning from space. When the amount of blood and water decreases, it becomes more difficult for the human body to work normally. Therefore, the heart no longer has to work as hard as it does on Earth. As a result, the heart becomes smaller.

Successful human research of space depends on understanding how the human body is influenced by the environment in outer space. Another benefit of this research is that the effects of space travel on the human body can help us better understand many illnesses suffered by people living on Earth, such as high blood pressure and other heart problems.

Note. The experimental passage was adapted from Peshkam et al. (2011). Seductive details are underlined.