

A Delayed Effect in Aspectual Mismatches and Processing Cost of Aspectual Adverbs

Ryo OBA

Summary

Aspectual mismatches between verbs and adverbs were observed in some experiments (Brenan and Pylkkänen, 2008; Ishii and Ishikawa 2014), but they did not agree as to at which region aspectual mismatches emerged in the course of reading through a sentence; Brenan and Pylkkänen (2008) observed aspectual mismatches just at the region where a verb appeared when a temporal adverbial modifier was preposed to the verb in English; on the other hand, in Ishii and Ishikawa (2014), aspectual mismatches were found at the later region in Japanese. A combination of choice experiment and self-paced reading experiment was conducted, and the result showed that the interpretation of aspect needed time to be processed in the course of reading, and therefore, it was conjectured that the delayed effect of aspectual mismatches observed in Ishii and Ishikawa (2014) emerged because the shorter adverbial modifiers they chose did not give subjects enough time to process the aspect of adverbs.

Keywords

semantic processing, aspectual mismatch, aspectual coercion, delayed effect, self-paced reading experiment

1. Introduction

Aspectual mismatches, where a verb describing a near-instantaneous punctual event co-occur with a durative adverb in a clause, and it describes repeating activity as a result, are observed in English as well as in Japanese

as shown in (1) and (2), where the words “jump” and “jampu-suru”, describe an instantaneous event, but once they are combined with a durational adverbial phrase, the event described in the sentence is considered repeated activity.

(1) The clown jumped for ten minutes.

(2) piero-wa juppun-kan jampu-sita
clown-TOP 10-minutes-for jump-PAST
“The clown jumped for ten minutes.”

Ishii and Ishikawa (2014), following Brennan and Pylkkänen (2008)’s experiments in English, investigated these mismatches with using Japanese stimuli sets, and concluded (i) that aspectual mismatches require coercion process which makes sentence-processing slower and (ii) that the difference between punctual verbs and durative verbs is continuous, not discrete. However, the data they obtained in the experiment were not clear-cut. They observed the difference in the speed of processing at the later region than at the region observed in Brennan and Pylkkänen (2008), and in addition to that, in Brennan and Pylkkänen (2008), the slower processing time of durative adverbs than that of punctual adverbs was observed at the verb region, where the aspectual mismatch emerged, but in their experiment, the opposite result was obtained at that region; Punctual adverbs needed more processing time than durative adverbs at the region. This paper addresses why aspectual mismatches were observed at the later region than the expected one in Ishii and Ishikawa (2014), which, hereafter, we will call the

delayed effect of aspectual mismatches.

In Ishii and Ishikawa (2014), at the region where they found that delayed effect, they also observed that punctual adverbs were read significantly slower than durative adverbs were, which indicates that the aspect of adverbs is related to aspectual mismatches, although they stopped further investigation in that region because this observation was not expected by their hypothesis. However, based on their findings, there are at least two plausible hypotheses to explain why the delayed effect of aspectual mismatches occurred at that region.

Hypothesis 1: The aspect of adverbs is only one factor which causes the delayed effect of aspectual mismatches at the verb region; in other words, this only gives the opposite effect against aspectual mismatches, so they are obscured at the region.

Hypothesis 2: The aspect of adverbs is a factor which causes the delayed effect of aspectual mismatches at the verb region, but the main factor is the aspect of verbs, which would have much stronger opposite effect against aspectual mismatches than the aspect of adverbs.

Moreover, one more factor has to be taken into consideration; In Ishii and Ishikawa (2014), only one pair of durative and punctual adverbial phrases was used; “ooyoso x kan (for around x)” as a durative adverbial phrase and “choodo x ni (at x sharp)” as a punctual adverbial phrase. These specific phrases would have obscured aspectual mismatches, and it would have caused the delayed effect of them.¹⁾ Thus, the following hypothesis is proposed.

Hypothesis 3: The aspect of adverbs is a factor which causes the delayed effect of aspectual mismatches at the verb region, but the main factor is the complexity of adverbial forms, which would have much stronger opposite effect against aspectual mismatches than the aspect of adverbs.

In this paper, we will use simpler adverbial phrase, “... kan (for ...)” and “... ni (at ...)” in addition to those used in Ishii and Ishikawa (2014) and examine to what extent the complexity of adverbs might obscure aspectual mismatches.

Now we have two questions to answer in this paper: (i) Can our experiment replicate Ishii and Ishikawa (2014)’s results, possibly more clearly than theirs? (ii) Which of the above three hypotheses seem to be the most appropriate to explain the delayed effect of aspectual mismatches at the verb region? The aim in this paper was to answer these questions, and in order to achieve it, the self-paced reading experiment was conducted with using Japanese sentences.

2. Experiment

The basic design of this experiment followed Ishii and Ishikawa (2014)’s, with some modifications. The experiment consisted of two phases. In the first phase, participants were asked to categorize verbs into two groups – durative and punctual – and to rate the degree of confidence on their categorization. In the second phase, a self-paced reading experiment with a posterior question was conducted with using different adverbial forms (complex and simple), different aspect of adverbs (durative and punctual),

and different aspect of verbs (durative and punctual), and reading times at each region of the target sentences were recorded.

If our experiment can replicate Ishii and Ishikawa's results, aspectual mismatches should be found at the region posterior to the verb, and because of the effect of the aspect of adverbs, reading times of punctual adverbs should be statistically slower than those of durative adverbs. If Hypothesis 1 is the most reasonable, no other statistical effects should be found. If Hypothesis 2 is the most reasonable one, in addition to the effect of the aspect of adverbs, reading times of punctual verbs should be statistically different from those of durative verbs because of the effect of the aspect of verbs. If Hypothesis 3 is the most reasonable, in addition to the effect of the aspect of adverbs, reading times of complex adverbs should be statistically different from those of simple adverbs because of the effect of the complexity of adverbial forms.

2.1. Participants

Thirty native speakers of Japanese, who were undergraduate students in Chuo University, participated in this experiment (ten males and twenty females). All but two participants (one male and one female) were right-handed.²⁾ All of the participants were paid to participate in the experiment.

2.2. Stimuli

For the target stimuli, fifty two sentences, the order of which is "Subject – Adjunct – Verb" as shown in (3), were composed. All of the adjuncts were not temporal modifiers.

- (3) gootoo-ga ginkoo-de happoo sita
 robber-NOM bank-LOC fire-a-gun-PAST
 “A robber fired a gun at the bank.”

Twenty six filler sentences were also constructed, and the number and order of the words in them were the same as those in the target sentences. In total, seventy eight sentences were all used as the stimuli in the first phase.

In the second phase, either a durative adverb or a punctual adverb was inserted into the target sentences used in the first phase, and those sentences were embedded in a main clause. So, the word order of the target sentences in the second phase was “Subject – (Durative or Punctual) Adverb – Adjunct – Verb –Matrix Subject – Matrix Verb”. As described above, there were two types in durative and punctual adverbs: complex and simple. All of the complex durative and punctual adverbs were of the form “ooyoso ... kan (for around ...)” and “choodo ... ni (at ... sharp)”, respectively, while for all of the simple durative and punctual adverbs, the modifiers, “ooyoso (around)” and “choodo (sharp)”, were dropped; thus, they were of the form “... kan (for ...)” and “... ni (at ...)”, respectively. Therefore, four types of target sentences were made for each target stimulus used in the first phase, so the total number of the target sentences was 208 (52 x 4). The example sentences are shown in (4), where the four types of adverbs were combined with the punctual verb “kusyami suru (sneeze)”.

- (4) a. kyooju-ga **choodo 16 zi-ni** kenkyuu-sitsu-de
 professor-NOM sharp 16 o'clock-at lab-LOC

kusyami sita to zemi-sei-wa shoogen sita
sneeze-PAST COMP seminar student-TOP testify-PAST

“The seminar student testified that the professor sneezed in the lab at
16 sharp.” (Complex Punctual Adverb)

b. kyooju-ga ooyoso 25 byoo-kan kenkyuu-sitsu-de
professor-NOM around 25 seconds-for lab-LOC

kusyami sita to zemi-sei-wa shoogen sita
sneeze-PAST COMP seminar student-TOP testify-PAST

“The seminar student testified that the professor sneezed in the lab for
around 25 seconds.” (Complex Durative Adverb)

c. kyooju-ga 16 zi-ni kenkyuu-sitsu-de kusyami sita to
professor-NOM 16 o'clock-at lab-LOC sneeze-PAST COMP
zemi-sei-wa shoogen sita
seminar student-TOP testify-PAST

“The seminar student testified that the professor sneezed in the lab at
16.” (Simple Punctual Adverb)

b. kyooju-ga 25 byoo-kan kenkyuu-sitsu-de kusyami sita to
professor-NOM 25 seconds-for lab-LOC sneeze-PAST COMP
zemi-sei-wa shoogen sita
seminar student-TOP testify-PAST

“The seminar student testified that the professor sneezed in the lab for
25 seconds.” (Simple Durative Adverb)

The 208 target sentences were divided into two sets, and each set was combined with new 52 filler sentences, where one of the four adverbs was used as an aspectual adverb, too. So, the total number of each stimulus set used in the second phase was 156 (104 target sentences plus 52 fillers).

2.3. Procedure

Subjects were divided into two groups and were assigned either stimulus set. They were seated in front of a Dell 23" (1920 x 1080) computer LCD.

In the first phase, each stimulus sentence was randomly represented on the screen using Praat ver. 5.1.15 (Boersma and Weenink, 2013) and subjects were instructed (i) to answer whether the event described in the stimulus happened “only once” (i.e., punctual) or “repeatedly” (i.e., durative), and (ii) to rate their decision on a four-point confidence scale, which ended up being not used in the following analysis. They were asked to click a button on the screen with the mouse to answer them. After four practice trials were presented to familiarize subjects with the task, they were asked to start the first phase.

In the second phase, followed by a little break after the first phase was finished, subjects were instructed to read at a natural pace such that they could answer the question about whether the event described in the sentence happened only once or repeatedly, just after finishing reading the sentence. Each stimulus sentence was divided into six regions; Subject, (Durative or Punctual) Adverb, Adjunct, Verb, Matrix Subject and Matrix Verb. Using LinguaTools ver 1.0.0.1 (Sakamoto and Yasunaga, 2010), six practice trials were presented prior to the beginning of the second phase to familiarize subjects with this task. In each trial, a fixation star appeared on

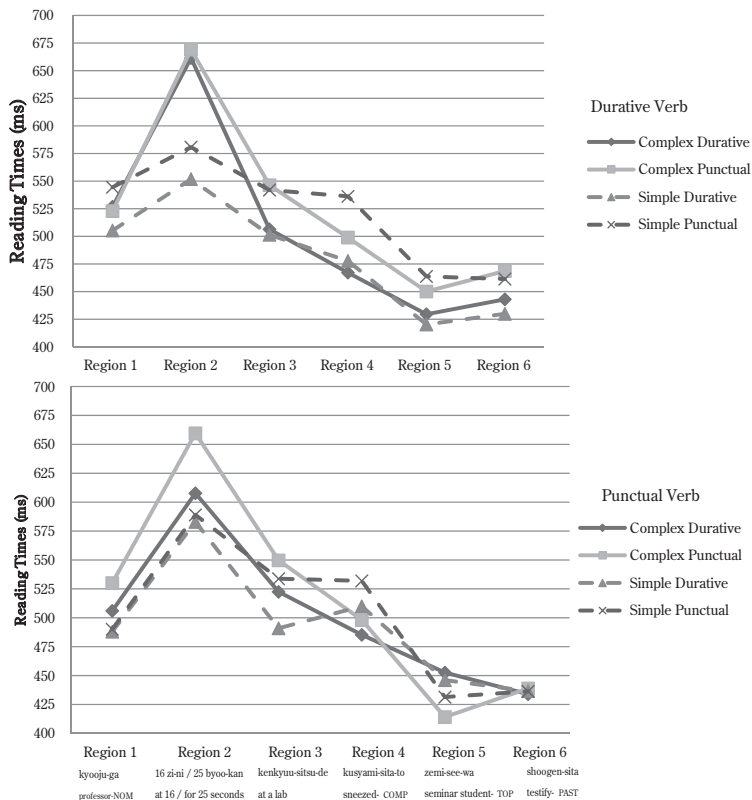
the center of the screen, and after pressing the spacebar on the keyboard, the phrase at the first region was presented on the screen. Pressing the spacebar, subjects were asked to read phrase-by-phrase at their own pace until each sentence ends. Just after finishing reading the sentence, subjects were required to answer the question described the above by pressing a key on the keyboard, the goal of which was to encourage subjects to focus on the aspect of the stimulus sentence (Pickering et al., 2006; Ishii and Ishikawa, 2014).

2.4. Results and Discussion

In Ishii and Ishikawa (2014), they expected that in the follow-up question in the second phase, each subject answered “the repeated events” if the target sentence included a durative adverb, while he/she answered “only once” if the sentence included a punctual adverb. Therefore, they did not take into consideration the data where the subjects did not respond the expected answer; as a result, 14.5% of the data were excluded from the analysis. However, the design of our experiment allowed subjects to take time to reprocess the meaning of the target sentence after reading the target sentence; thus, it might not be appropriate to consider that the answers in the follow-up questions directly reflected the reading times the subjects spent on reading the target sentence, and hence, the answers in the follow-up questions should be ignored, and all of the data were used in this analysis.

For each of the six regions, reading times 2.5 longer than the standard deviation from the mean were considered outliers, and they were removed. According to this criterion, 2.7% of the data were removed in Region 4, 2.5% in Region 5, 2.4% in Region 3, and 2.3% in Region 2. Mean phrase-by-

Figure 1: Average reading times at each region. The data were divided into two parts only for readability. Only the simple adverbs were used as example phrases for a spatial reason.



phrase reading times are shown in Figure 1.

To see whether or not aspectual mismatches were observed in Region 5, and to see whether or not the delayed effect of them emerged in Region 4, as well as observed in Ishii and Ishikawa (2014), and to see whether or not the complexity of adverbial forms effected the reading times in Region

4 and 5, reading times in both regions were examined. A 2 (Complexity of Adverbial Forms) \times 2 (Aspect of Adverbs) \times 2 (Aspect of Verbs) full-factorial ANOVA examined the effects of the complexity of adverbial forms (Complex and Simple), the aspect of adverbs (Durative and Punctual) and the aspect of verbs (Durative and Punctual).³⁾ For Region 5, there were no significant differences for the main effects, but there was a significant effect for the interaction between the aspect of adverbs and the aspect of verbs [$F_1(1, 29) = 17.354, p < .0005, \text{partial } \eta\text{-squared} = .006; F_2(1, 51) = 17.434, p < .0005, \text{partial } \eta\text{-squared} = .006$], which meant there were differences in how much reading times were spent in the conditions. Post-hoc tests found that in the “Durative Adverb” condition, there was a significant difference between durative verbs and punctual verbs only in the subject analysis [$F_1(1, 29) = 6.444, p = .011, \text{partial } \eta\text{-squared} = .004; F_2(1, 51) = .888, p = .346, \text{partial } \eta\text{-squared} = .001$], and in the “Punctual Adverb” condition, there was a significant difference between durative verbs and punctual verbs both in the subject analysis and in the item analysis [$F_1(1, 29) = 11.355, p = .001, \text{partial } \eta\text{-squared} = .007; F_2(1, 51) = 10.982, p = .001, \text{partial } \eta\text{-squared} = .007$]; furthermore, in the “Durative Verb” condition, there was a significant difference between durative adverbs and punctual adverbs in both subject and item analyses [$F_1(1, 29) = 13.185, p < .0005, \text{partial } \eta\text{-squared} = .007; F_2(1, 51) = 13.268, p < .0005, \text{partial } \eta\text{-squared} = .007$], and in the “Punctual Verb” condition, there was also a significant difference between durative and punctual adverbs in both subject and item analyses [$F_1(1, 29) = 6.089, p = .014, \text{partial } \eta\text{-squared} = .005; F_2(1, 51) = 6.079, p = .014, \text{partial } \eta\text{-squared} = .005$]. These showed that when the aspect of adverbs was matched with that of verbs (i.e., a durative adverb + a durative verb [$M = 409.4, \text{sd} = 180.2, n =$

951] and a punctual adverb + a punctual verb [$M = 407.3$, $sd = 178.9$, $n = 571$]), both reading times were faster than those where the aspect of those adverbs was mismatched with that of those verbs, respectively (i.e., a durative adverb + a punctual verb [$M = 434.8$, $sd = 197.7$, $n = 571$] and a punctual adverb + a durative verb [$M = 440.3$, $sd = 188.8$, $n = 948$]). This result showed much clearer difference than that of Ishii and Ishikawa (2014) did.

For Region 4, a significant difference for the main effect of the aspect of adverbs was only found both in the subject analysis and in the item analysis [$F_1(1, 29) = 8.117$, $p = .004$, partial eta-squared = .003; $F_2(1, 51) = 8.106$, $p = .004$, partial eta-squared = .003], which meant that punctual adverbs [$M = 487.20$, $sd = 241.01$, $n = 1509$] needed more processing time than durative adverbs [$M = 462.61$, $sd = 235.46$, $n = 1527$]. This indicated that this experiment replicated Ishii and Ishikawa (2014). None of the other main effects or interactions were found to be significant, which suggested that neither the complexity of adverbial forms nor the aspect of verbs gave any effect to the aspectual mismatches between the adverbs and the verbs; This result indicated that the aspectual mismatches between adverbs and verbs at Region 4 might be obscured by the opposite effect given only by processing the aspect on adverbs.

A further 2 (Complexity of Adverbs) x 2 (Aspect of Adverb) ANOVA test confirmed that at Region 3, there was only a significant difference for the main effect of the aspect of adverbs in the subject and item analyses [$F_1(1, 29) = 10.085$, $p = .002$, partial eta-squared = .003; $F_2(1, 51) = 10.110$, $p = .001$, partial eta-squared = .003]. The processing cost of punctual adverbs [$M = 514.5$, $sd = 248.5$, $n = 1513$] was more required than that of durative adverbs [$M = 487.2$, $sd = 225.5$, $n = 1532$]. Neither of the other main effect nor the

interaction was found to be significant difference. Meanwhile, at Region 2, there was only a significant difference for the main effect of the complexity of adverbial forms in the subject and item analyses [$F_1(1, 29) = 27.261, p < .0005$, partial eta-squared = .009; $F_2(1, 51) = 27.056, p < .0005$, partial eta-squared = .009], which were easily predicted because the complex adverbs had 4 more moras than the simple adverbs had; thus, the slower reading times of the whole complex adverbs than those of the whole simple adverbs were expected. Neither of the other main effect nor the interaction was found to be significant difference. This suggested that processing the aspect of adverbs started just after reading the adverbs, and it needed a certain amount of time to be done. Interestingly, in Brennan and Pykkänen (2008), it was also observed that processing a punctual adverb took longer time than processing a durative adverb prior to the verb region,⁴⁾ and they postulated that this difference in processing times between aspectual modifiers could become one factor causing the opposite effect against aspectual mismatches; because of this, no significant difference was found in processing times between the aspectual matched vs. mismatched sentences at the verb region in the item analysis [$T_2 = 185, p = .34$]. Indeed, the same tendencies were found for the processing of aspectual modifiers both in Brennan and Pykkänen (2008) and in our experiment, but the only difference between them was that the much stronger opposite effect was found in our experiment. It could be, however, conjectured from the different environment of the target sentences between them, in other words, the total number of phrases configuring the adverbial phrase. In Brennan and Pykkänen (2008), the adverbial phrases consisted of three words, and the punctual adverbs were read significant differently faster than the

durative adverbs at the region between the adverbs and the verbs, and marginally differently during the reading of the adverbs. This suggested that the aspect of adverbs started being processed during reading the longer adverbs, and that processing was almost done before the verb appeared. Its residual processing burden might give the opposite effect against aspectual mismatches, and as a result, no significant difference was found at the verb region in the item analysis in their experiment. In our experiment, on the other hand, the aspectual modifiers consisted of only one phrase; they would be so short that the processing of their aspect finished during reading them, and it would continue during processing of the verb. Because of this, the stronger opposite effect against aspectual mismatches might emerge at Region 4 in our experiment.

In summary, this experiment replicated the results obtained in Ishii and Ishikawa (2014)'s experiment using Japanese sentences; (1) the delayed effect of aspectual mismatches in fact emerged just after the region the verb appeared, not at the same time observed in Brennan and Pykkänen (2008), and (2) the processing of the aspect of adverbs affected the reading times at the region where the verb appeared. Furthermore, of all the hypotheses we assumed in section 1, the prediction from Hypothesis 1 seemed to meet with the results we obtained. The opposite effect of the aspect of adverbs against aspectual mismatches was found at Region 4, and this kind of effect was also found in Brennan and Pykkänen (2008), which was much smaller, though. It was conjectured that the difference in strength between them was due to the length of the adverbial phrases; when they were enough long to give time to process the aspect of adverbs, the opposite effect would become smaller at the verb region as observed in Brennan and Pykkänen (2008);

otherwise, the strong opposite effect against aspectual mismatches would emerge as observed in our experiment.

3. Conclusion

In this paper, a self-paced reading test was conducted to investigate why the explicit delayed effect of aspectual mismatches between adverbs and verbs was observed in Ishii and Ishikawa (2014). The results of the experiment suggest that the aspect of adverbs gave the opposite effect against aspectual mismatches, which was also observed in Brennan and Pylkkänen (2008) but it was much stronger than that in Brennan and Pylkkänen (2008). We speculated that this was because of the length of adverbs; If the adverbs are enough long to start processing their aspect during reading them, processing the aspect of adverbs would be finished before the verb appears; thus, the opposite effect of the aspect of adverbs would be difficult to be found at the verb region. Otherwise, the strong opposite effect would emerge at the verb region, as observed in this experiment. Examining whether or not this speculation is on the right track will be left open for future research.

Acknowledgement

This research was supported by JSPS KAKENHI Grant Number 245520440. I also thank Kiyoshi Ishikawa and So Ishii for helpful comments and help in the materials creation of the experiment.

Notes

- 1) This possibility was suggested by Ishii (p.c.).
- 2) The data of these two left-handed participants were included in our analysis

because it was plausible to assume that the design of this experiment did not receive any harmful effect by the subjects of different dominant hands.

- 3) For all of the following ANOVAs, I did not check any of the assumptions of them.
- 4) They assumed that this was because a subset of punctual modifiers they used could be associated with a narrative shift, which Zwaan (1996) showed caused modifiers to be processed more slowly. But their test sentences were presented in isolation; therefore, it remained unclear whether a narrative shift was really related with the fact that the process of punctual adverbs needed more time to be processed than that of durative adverbs.

References

- Boersma, P. ; Weenink, D. (2013). *Praat: Doing phonetics by computer* [Computer program]. Version 5.1.15, <http://www.praat.org/> (accessed 2015-03-31).
- Brennan, J. ; Pyykkänen, L. (2008). “Processing events: Behavioral and neuromagnetic correlates of aspectual coercion.” *Brain & Language*, 106, 132-143.
- Ishii, S. ; Ishikawa, K. (2014). “Discrete vs. Continuous Semantic Categories: A study of real-time processing of aspectual properties.” *The Proceedings of the 31st Annual Conference of the Japanese Cognitive Science Society*.
- Pickering, M. J. ; McElree, B. ; Frisson, S. ; Chen, L. ; Traxler, M. J. (2006). “Underspecification and aspectual coercion.” *Discourse Processes*, 42, 131-155.
- Sakamoto, T. ; Yasunaga, T. (2010). *LinguaTools* [Computer program]. Version 1.0.0.1, <http://www2.lit.kyushuu-u.ac.jp/~sakamoto/exp.html>. (accessed 2015-03-31).
- Zwaan, R. A. (1996). “Processing narrative time shifts.” *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22(5), 1196-1207.

Appendix

Stimuli

1. プロレスラーが、(ちょうど) 19時に / (おおよそ) 10秒間、審判に、頭突きしたと、スポーツ紙は、報じた。
2. ダイナマイトが、(ちょうど) 1時に / (おおよそ) 10分間、保管庫で、爆発したと、新聞社は、報道した。
3. 有名女優が、(ちょうど) 15時に / (おおよそ) 30秒間、喫茶店で、げっぶ

したと、店員は、暴露した。

4. ガスボンベが、(ちょうど) 15時 / (おおよそ) 15分間に、化学工場で、破裂したと、ニュースキャスターは、報道した。
5. 熊が、(ちょうど) 7時に / (おおよそ) 2分間、ワゴン車に、体当たりしたと、猟師は、言い張った。
6. 流れ弾が、(ちょうど) 1時に / (おおよそ) 40秒間、民家に、直撃したと、市長は、公表した。
7. ミサイルが、(ちょうど) 21時に / (おおよそ) 2分間、基地に、着弾したと、司令官は、発表した。
8. 銃弾が、(ちょうど) 20時に / (おおよそ) 10秒間、車体に、命中したと、運転手は、証言した。
9. 万引き犯が、(ちょうど) 19時に / (おおよそ) 10秒間、警官に、パンチしたと、通行人は、証言した。
10. 戦車が、(ちょうど) 15時に / (おおよそ) 20秒間、山岳地帯で、被弾したと、兵士は、報告した。
11. 落石が、(ちょうど) 12時に / (おおよそ) 30分間、高速道路で、起きたと、消防庁は、発表した。
12. 自動ドアが、(ちょうど) 22時に / (おおよそ) 15分間、誤作動で、開閉したと、店長は、愚痴った。
13. 強盗が、(ちょうど) 14時に / (おおよそ) 10秒間、銀行で、発砲したと、検察官は、立証した。
14. ランナーが、(ちょうど) 9時に / (おおよそ) 1分間、スタート地点で、深呼吸したと、観客は、主張した。
15. リンゴが、(ちょうど) 15時に / (おおよそ) 3分間、枝から、降ってきたと、科学者は、回想した。
16. 祖父が、(ちょうど) 19時に / (おおよそ) 20分間、スマートフォンから、ツイートしたと、孫は、言い張った。
17. 教授が、(ちょうど) 16時に / (おおよそ) 25秒間、研究室で、くしゃみしたと、ゼミ生は、証言した。
18. 息子が、(ちょうど) 8時に / (おおよそ) 5分間、玄関で、屈伸したと、父親は、言い張った。
19. ビリヤードボールが、(ちょうど) 17時に / (おおよそ) 15秒間、テーブル上で、跳ね返ったと、プレイヤーは、証言した。
20. 高校生が、(ちょうど) 17時に / (おおよそ) 2分間、電車内で、スクワットしたと、車掌は、報告した。

21. 部長が、(ちょうど) 14時に / (おおよそ) 5分間、報告書に、捺印したと、課長は、主張した。
22. 社長が、(ちょうど) 13時に / (おおよそ) 5分間、書類に、署名したと、秘書は、報告した。
23. 雷が、(ちょうど) 3時に / (おおよそ) 30分間、沖合で、鳴ったと、船員は、報告した。
24. 稲妻が、(ちょうど) 11時に / (おおよそ) 15分間、海上で、光ったと、船長は、力説した。
25. 小学生が、(ちょうど) 16時に / (おおよそ) 3分間、校庭で、懸垂したと、担任は、報告した。
26. 皮膚細胞が、(ちょうど) 10時に / (おおよそ) 5日間、試験管内で、分裂したと、研究者は、報告した。
27. 水滴が、(ちょうど) 7時に / (おおよそ) 1分間、蛇口から、落ちたと、作業員は、報告した。
28. 迷惑メールが、(ちょうど) 23時に / (おおよそ) 3時間、ケータイに、届いたと、女子大生は、証言した。
29. 体操部員が、(ちょうど) 10時に / (おおよそ) 30秒間、マットで、前転したと、卓球部員は、証言した。
30. 星が、(ちょうど) 23時に / (おおよそ) 10秒間、上空で、またいたと、観測者は、力説した。
31. 苦情が、(ちょうど) 16時に / (おおよそ) 2時間、カスタマーセンターに、きたと、職員は、愚痴った。
32. 人気アイドルが、(ちょうど) 19時に / (おおよそ) 5秒間、ファンに、ウィンクしたと、週刊誌は、報じた。
33. 雷が、(ちょうど) 2時に / (おおよそ) 10分間、上空で、発生したと、登山家は、回想した。
34. 泡が、(ちょうど) 12時に / (おおよそ) 5分間、水面で、はじけたと、海水浴客は、主張した。
35. 幼稚園児が、(ちょうど) 12時に / (おおよそ) 30秒間、公園で、ジャンプしたと、主婦は、証言した。
36. 校長が、(ちょうど) 9時に / (おおよそ) 5秒間、教壇で、うなずいたと、生徒は、主張した。
37. ノミが、(ちょうど) 13時に / (おおよそ) 1分間、裏庭で、跳ねたと、おじいさんは、言い張った。
38. 体育教師が、(ちょうど) 10時に / (おおよそ) 20秒間、教室で、腕立て伏

- せしたと、学生は、言いふらした。
39. 波が、(ちょうど) 6時に / (おおよそ) 30分間、岸壁に、打ち寄せたと、釣り人は、証言した。
40. 妹が、(ちょうど) 21時に / (おおよそ) 3分間、リビングで、しゃっくりしたと、兄は、言いふらした。
41. 赤ん坊が、(ちょうど) 11時に / (おおよそ) 10秒間、寝室で、まばたきしたと、母親は、力説した。
42. 海面が、(ちょうど) 15時に / (おおよそ) 40分間、沖合で、波打ったと、乗組員は、主張した。
43. 売れっ子小説家が、(ちょうど) 15時に / (おおよそ) 1時間、著書に、サインしたと、新聞は、報じた。
44. サッカーボールが、(ちょうど) 17時に / (おおよそ) 5秒間、坂で、バウンドしたと、中学生は、証言した。
45. 弟が、(ちょうど) 22時に / (おおよそ) 7分間、自室で、腹筋したと、姉は、言いきった。
46. 蛍光灯が、(ちょうど) 19時に / (おおよそ) 10分間、室内で、点滅したと、ホテルマンは、証言した。
47. 柔道部員が、(ちょうど) 17時に / (おおよそ) 10分間、廊下で、うさぎ跳びしたと、学級委員は、言いつけた。
48. 雨粒が、(ちょうど) 18時に / (おおよそ) 15分間、窓ガラスに、当たったと、老人は、回想した。
49. 花火が、(ちょうど) 20時に / (おおよそ) 10分間、海辺で、上がったと、見物客は、証言した。
50. 野球部員が、(ちょうど) 18時に / (おおよそ) 1時間、グラウンドで、素振りしたと、監督は、証言した。
51. バレー部員が、(ちょうど) 16時に / (おおよそ) 1時間、練習で、サーブしたと、顧問は、言い張った。
52. バスケ部員が、(ちょうど) 18時に / (おおよそ) 30分間、練習で、シュートしたと、マネージャーは、記録した。

