Is the Four-Character-per-Second Word Limitation Outdated?

An Empirical Study of Japanese Film Subtitling

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Japan has been one of the subtitling countries since the release of the first subtitled film in 1931. However, few studies investigated the now de facto standard of Japanese subtitling, i.e. the 4 CPS (character per second) rule. This paper examines the appropriateness of this rule based on eye-tracking experiment on ten graduate students. In the experiment, the participants watched three different versions of subtitled films, created under 4, 6, and 8 CPS conditions respectively. A questionnaire was administered afterward to ask the participants about their film viewing experience in this experiment. The results indicated that a majority of the participants preferred 6 CPS versions of subtitled films, indicating that the traditional 4 CPS rule may be a bit outdated for today's audience. The author also conducted interviews with two professional subtitle translators to seek opinions from practitioners involved in the industry. This paper is based on my masters' thesis.

1. Introduction

In recent years, there has been a growing interest in subtitle translation. According to Linde and Kay (1999), there are two types of subtitling: intralingual and interlingual. Intralingual subtitling is for hard-of-hearing people, while interlingual subtitling is for foreign language films. Interlingual subtitling experts have identified several constraints related to background sounds and visual imagery (e.g. Díaz-Cintas, 2013; Georgakopoulou, 2009; Linde & Kay, 1999; Tveit, 2009). For interlingual translators, one of the biggest challenges is maintaining a balance between producing readable subtitles and allowing viewers the experience to enjoy sound and visual images. As a result, translation strategies are needed in order to make subtitles readable for all viewers (Pedersen, 2005). Readability of subtitles has been studied using an eye-tracking tool (e.g. Caffrey, 2012; Schotter & Rayner, 2012). In addition, new technological developments in subtitling have allowed viewers to become creators of subtitles. Amateur subtitlers can now

break traditional translation practices and develop new forms of translation. Thus, the environment around the subtitling industry has changed.

Japan is a subtitling country where most of the imported films are subtitled. TV programs imported from abroad are often broadcasted with Japanese subtitles, too. The current rules of Japanese subtitling were established in 1931 (Toda, 1994) and there have been few studies investigating this topic. The current study reexamines the appropriateness of the now de facto rule of Japanese subtitling, i.e. the 4 CPS (character per second) rule, and proposes that the translation quality could be improved by expanding this CPS limitation.

2. Background of Research
2.1 Subtitling rules and constraints

Gottlieb (2012) defined subtitling as "diamesic translation in polysemiotic media (including films, TV, video and DVD) in the form of one or more lines of written text presented on the screen in sync with the original verbal content" (p. 37). He explained "diamesic" translation as the type of verbal transfer that crosses over from speech to writing. According to Gottlieb (2012) :

> The term polysemiotic refers to the fact that in film and TV productions, up to four semiotic channels are in operation simultaneously: two nonverbal channels (image plus music & sound effects) and two verbal channels (dialogue, including narration and songs, plus written pictorial elements) (p. 37).

When watching subtitled movies, viewers have to concentrate on both the subtitles and the images. According to Díaz-Cintas (2013), subtitle translators have to take into account three constraints: spatial, temporal and linguistic. In terms of spatial constraints, subtitles are usually displayed at the bottom of the screen. However, when important pictorial information is shown at the bottom of the screen, subtitles are accordingly moved to the top of the screen (Gottlieb, 2012). Since space is limited, a maximum of two subtitle lines per scene are allowed. As for temporal constraints, subtitles should be displayed on the screen at the precise moment the actor starts speaking and disappear as soon as the speaking stops. Precise in-and-out timing is essential and subtitles should be in balance with the appropriate reading time setting (Georgakopoulou, 2009). For linguistic constraints, original dialogues are usually reduced in order to fit the utterance on screen. Depending on the duration of speech, reduction or omission may be applied partially or totally. These constraints lead to a necessary reduction in the number of words on the screen (Munday, 2012). The experiment of Linde and Kay (1999) indicated that subtitles contained 43% less text than the original dialogues. However, this study did not include Japanese subtitles. Tveit (2009) pointed out that another lexical constraint is that the

spoken words contain dialectal and sociolectal features. In addition to this, ideolectal features that are peculiar to a certain character in the movie could be obstacles for subtitlers (Gottlieb, 1994).

Under these constraints, it is impossible to translate all the original dialogue and subtitlers have to decide how information or cultural references should be rendered. Ushie and Nishio (2008) noted that *generalization, specification* and *substitution* were applied to Japanese subtitles. These strategies were used in order to reduce the viewer's cognitive load. Ushie and Nishino (2008) pointed out that although the degree of specificity differed between the original and the subtitles, an equivalent effect was achieved. On the other hand, Shinohara (2013a) observed that even though subtitlers aimed for readable subtitles, these strategies could confuse viewers. For instance, she mentioned that due to word limitation, omission was applied to a set of subtitles. It was not possible to translate all of the information from the source language; thus, the subtitler omitted keywords or phrases from one subtitles and added them to the next frame. According to Shinohara (2013a), viewers may not be satisfied with these subtitles because the subtitles do not match the original dialogues.

2.2 Japanese subtitling rules and researches

According to the Foreign Film Importer-distributors Association of Japan, the numbers of subtitled movies outnumber dubbed films. It is obvious that Japan is a subtitling country and viewers in Japan are familiar to subtitled films. According to Takeda (2013), these subtitles are created in accordance with the rule of "four characters per second for each frame". Furthermore, it can be no more than two lines, with each line containing a maximum of twelve to thirteen characters. Such rules were established in 1931, when *geisha* working in Shinbashi, Tokyo, were recruited as participants of a study to investigate how many words-per-second people can read without too much difficulty (Toda, 1994). The study found that 4 CPS was the most appropriate number and it has become an accepted rule in the subtitling industry since then.

On the other hand, a recent survey reported in Shinohara (2013a) suggested that viewers were not always satisfied with the current subtitling practices. More than half the viewers surveyed felt dissatisfied with the translation quality even though they preferred subtitles to dubbing.

There has been little research done to reexamine the 4 CPS rule even though younger audience today appear to have difficulty in reading subtitles and they prefer dubbing to subtitles and usually do not watch subtitled films (Kagaya, 2010). Still, a large number of people chose subtitled films for reasons such as wanting to hear the actor's voice and for studying a language (Shinohara, 2013a). In addition to this, Gottlieb (2012) pointed out that the majority of people spend more time skimming through web-based media for information rather than reading newspapers and books.

2.3 Eye-tracking studies

In this section, eye-tracking studies will be reviewed. O＇Brien (2006) noted several drawbacks of eye-tracker, pointing out that whilst modern eye-trackers compensate for head movement, they are not always accurate and data is lost when participants look away from the screen. On the other hand, Schotter and Rayner (2012) observed that it is possible to measure eye movements and exert experimental control in studies to deduce what is happening in the mind. They also identified two stages of eye movement. One is *saccades*, which refers to the actual movements of the eyes. The other is *fixation*, the period of time when the eyes are relatively stable. They also discussed Japanese features of subtitling, "When only logographic characters (kanji) are used, the perceptual span is shorter than when mostly syllabic characters (kana) are used (Osaka, 1987), indicating that informational density of the text modulates perceptual span" (Shotter & Rayner, 2012, p. 96). Professional subtitlers are thus known to make use of kanji in order to decrease the number of characters they use in rendering Japanese subtitles (Shinohara, 2013a).

Caffrey＇s (2012) study on viewer perception integrated the use of eye-tracker with a follow-up questionnaire. In this experiment, he used a Japanese TV animation that introduced "pop-up gloss" in addition to subtitles. According to Caffrey (2012), "pop-up gloss" refers to notes that are displayed on screen to explain or comment on culturally marked items appearing in each of the semiotic channels. From pop-up gloss, participants would be able to understand culturally marked items. The results suggested that since viewers had further background information, they would enjoy foreign films more thoroughly. Unfortunately, these types of subtitling formats are not common in Japan and are not suited for theater-released films because too many subtitles are displayed successively and viewers end up skipping several subtitles.

Among some of the studies on Japanese subtitles, Kogo and Kishi (1996) found that reading speed lengthened as the number of characters and subtitle lines increased. The study also suggested that viewers can read faster with one-line subtitles than with two-line subtitles even if the total number of characters is the same. They further observed that the average reading time by viewers was 51.2 % of the total display time of the subtitles. In other words, the viewers spent half of the time reading when the subtitles were on the screen. The subtitles used in their experiment followed the traditional 4 CPS norm.

2.4 Research questions

Previous studies on subtitle translation did not specifically examine the character number limitation of Japanese subtitles. As mentioned earlier, it has been nearly half a century since the now de facto standard of 4 CPS rule of Japanese film subtitling was established. Reading habits of people have changed since then (Gottlieb, 2012), and so should have the reading speed of the average film audience. With such changes in mind, I propose the following two research

questions in the present study:

RQ1. Is the current 4 CPS rule of Japanese film subtitling an outdated norm?

RQ2. What is the most appropriate norm of Japanese subtitling in terms of the number of characters per second?

3. Research Method

To explore these questions, an experiment was conducted at a private university in western Japan to investigate how university students react to subtitled videos prepared under different conditions as to the number of characters per second.

3.1 Participants

Ten Japanese graduate students (three men and seven women) were recruited for this experiment. They are between 20 and 49 years of age, with a half of the participants in their twenties. All the participants majored in foreign language pedagogy and their English proficiency was higher than average, with their TOEIC scores ranging from 600 to 980. All the participants responded to the questionnaire (cf. Section 3.3) saying that they "often" or "always" watched subtitled movies and preferred subtitle to dubbing when it came to viewing foreign films.

3.2 Instruments

The film clips used in the experiment were taken from *Psycho* (1960) directed by Alfred Hitchcock and *Black Swan* (2010) by Darren Aronofsky.

In order for the participants to be able to focus on subtitles, the plot of the film should be easily understood. Historical or documentary films requiring background knowledge to understand may negatively affect the readability of subtitles added to such films (Gottlieb, 1994). Minchinton (1993) suggested that viewers could predict the dialogue when they watch love stories (as cited in Tveit, 2009). Thus, I selected movies whose plots were not predictable yet require no specific background knowledge to follow the stories being told. *Psycho* is one of Hitchcocks' best suspense films, but it is not well-known among young people today. *Black Swan*, a relatively new film, belongs to the same genre as that of *Psycho*. Most of the participants had not watched these movies before, except for participant C who had watched both movies prior to this experiment.

The extraction of video images and subtitle data including English transcriptions and in-and-out timing from DVDs was carried out using free software, DVD Decrypter and Subrip. Three scenes from each movie were then selected to create short video clips whose length were about five minutes each. For each video clip, three versions of Japanese subtitle were prepared under

different CPS conditions: i.e. 4, 6, and 8 characters per second.

Both 4 CPS and 6 CPS versions contained no more than two lines of subtitle per frame. In the case of 8 CPS version, however, up to three lines per frame were accepted for the purpose of capturing eye movements on the unusual amount of subtitles. The translation of English transcriptions into Japanese subtitles was done by the present author. Although the focus of translation was more on quantity rather than quality, the Japanese subtitles were checked by a professional translator so that the quality was good enough to conduct this experiment.

3.3 Procedure

Each participant watched six video clips on a 17 inch computer monitor for a total of 30 minutes; three from *Psycho* and three from *Black Swan*. The order of the videos watched varied from person to person. For instance, one participant watched them in narrative order while others watched it randomly. The CPS versions were also assigned differently. Viewer perception was simultaneously captured by Tobii Pro X2-60 eye-tracker. Participants sat 60 cm from the computer screen.

For data analysis, I excluded participants who had less than 85% of pupil data in order to maintain data credibility (Caffrey, 2012). For example, the eye-tracker captured 40 % of eye data for participant B for the entire video. 60% of the data was lost because the participant looked away from the computer monitor or the eye-tracker was not able to capture the data. As a result, seven participants (three men and four women) were left for analysis. People shift their gaze back and forth between the subtitle and the movie (Schotter & Rayner, 2012). Based on this analysis, the Areas of Interest (AOIs), which define areas of certain interest provided by Tobii eye tracker, were used to analyze statistics for eye tracking. Two AOIs, "projected image" and "subtitles" were created for each video (see Figure 3-1). Scenes which had no subtitles for more than 20 seconds were excluded. In this condition, total visit duration of each AOIs was counted. Gaze path was also considered in order to analyze characteristics of eye movement. As Hosaki and Suzuki (1997) suggested, long scenes were not necessary as figures would be unclear, so 14 second scenes were analyzed.

After watching the videos, participants were asked to fill in a questionnaire containing the following questions:
- ・Which video clip did you think was the most appropriate? (For each film)
- ・Were there any problems with the subtitles in terms of the amount of subtitles and translation quality?
- ・Which did you concentrate more on: projected images or subtitles? (For each video clip)
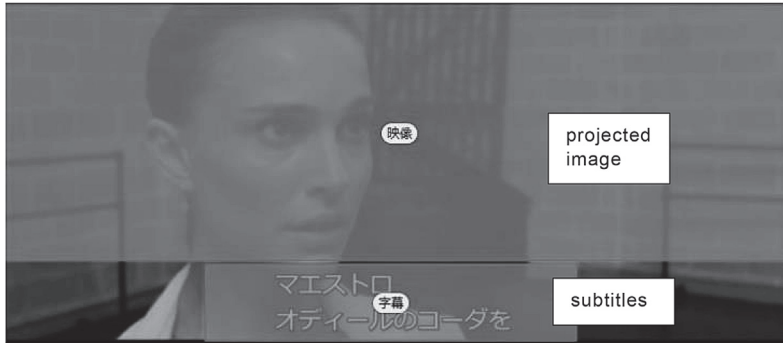- ・What do you think about the subtitles in general?

Figure 3-1. AOIs (Areas of Interests) of projected image and subtitles

4. Results of Experiment

4.1 Questionnaire

The data of questionnaire is used for focusing on translation quality and viewers' opinions of subtitles, thus all ten participants' data will be analyzed. Table 4-1 shows the number of participants who concentrated more on the projected images than the subtitles. According to the questionnaire, eight participants concentrated more on the images when they watched the 4 CPS (characters per second) version of the subtitled video, while two participants spent most of the time reading subtitles. As the number of CPS increases, participants concentrated more on the subtitles in case of *Psycho*. As for *Black Swan*, however, there was no difference among the three CPS conditions. Under all conditions, eight out of ten participants answered they concentrated more on the images. According to the questionnaire, two participants (participants I and J) were bothered by the excessive use of subtitles in the 8 CPS condition, while participant F responded that there was no reading problem and she felt more subtitles could be added. Participant H felt that the subtitles of *Psycho* were relatively long and said she spent most of the time reading subtitles.

Table 4-1. Participants' concentration on two AOIs (i.e. projected images and subtitles) under three subtitling conditions (n=10)

Subtitling Condition	Psycho		Black Swan	
	image	subtitle	image	subtitle
4 CPS*	8	2	8	2
6 CPS	7	3	8	2
8 CPS	5	5	8	2

*CPS =Characters per second

Figure 4-1 below shows the most appropriate subtitles of *Psycho* and *Black Swan* in terms of translation quality and amount of subtitles. Participants were asked to choose one video clip that

they could enjoy without being bothered by the excessive amount of subtitles and odd translation. The subtitling conditions were not open to them. In other words, participants chose the most appropriate subtitles without knowing which CPS condition was applied to each of them.
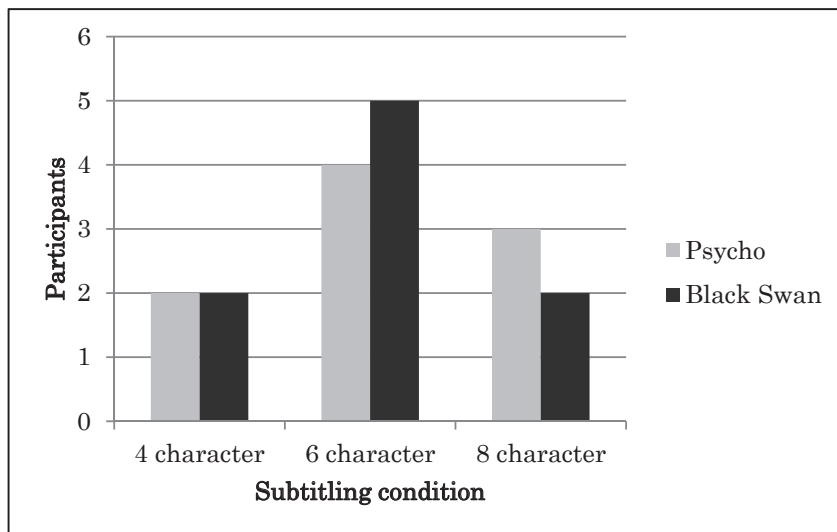

Figure 4-1. The most appropriate subtitling conditions in terms of quality and quantity (n=9)

As seen in Figure 4-1, the majority of participants chose the 6 CPS versions as the best subtitles in both movies. Participant C did not notice any significant differences or incongruity among the subtitles created under different CPS conditions. According to the questionnaire, she had watched both films before, so she was familiar with the stories. For this reason, she probably did not need to read the subtitles. Therefore only nine out of ten valid responses could be extracted from this experiment. Regarding quality issues, participant D wrote that the subtitles of *Black Swan* were more faithfully translated than that of *Psycho*. Participant H also felt that the subtitles of *Black Swan* were more natural, while that of *Psycho* were more like straight translation. Regarding quantity of subtitles, some students had difficulty in reading the 8 CPS subtitles as mentioned above.

4.2 Participants' comments
Besides subtitles in the experiment, participants expressed their thoughts about subtitles in general. Three participants (participants C, E, and G) explained the kinds of subtitles which could be an obstacle in reading. Participant C responded that a complicated story can hinder the reading of subtitles. She also commented that the combination of horizontal and vertical subtitles was sometimes hard to read. Participant C did not feel any partiality with a specific

subtitling condition or format. In addition, participant G, who chose the 8 CPS version for *Psycho* and 6 CPS version for *Black Swan* as the most appropriate subtitles, said, "By concentrating too much on subtitles, I would miss the images so I tended to read subtitles quickly." Participant E answered that while he preferred subtitles, he would occasionally watched dubbing when he got tired of reading subtitles. He chose the 6 CPS versions for both movies as the best subtitle renditions. As an English learner, participant F commented that he habitually tries not to read subtitles in order to improve language skills. He chose the 8 CPS version for *Psycho* and the 4 CPS version for *Black Swan*. Furthermore, another learner (participant D) mentioned, "subtitles can help understand the story, but they become obstacles if I can understand English." She chose the 8 and 6 CPS versions for *Psycho* and *Black Swan* respectively. Participant J said, "I usually depend on subtitles and do not pay attention to the original spoken dialogue so much. But Japanese subtitles support listening and understanding of English dialogues." She chose the 6 CPS subtitles for both films. Two participants complained about traditional subtitles. Participant A, who chose the 6 CPS version for *Psycho* and the 8 CPS version for *Black Swan* as the most appropriate subtitles, commented that many subtitles were translated oddly and spoiled the original movie. Another student (participant H) said, "Japanese subtitles convey less information than the original dialogue, so I try to watch English subtitles." Participant H chose the 4 CPS version for *Psycho* and the 6 CPS version for *Black Swan*. The results echo Shinohara's survey (2013a), which suggested viewers are not always satisfied with the subtitles created under the 4 CPS condition.

4.3 Eye-tracking data

Tables 4-2 and 4-3 show the ratio in percentage of the total time spent by each participant on viewing subtitles vs. projected image (non-subtitles area). Table 4-2 shows results of *Psycho* and Table 4-3 shows those of *Black Swan*. The numbers in brackets next to the 6 and 8 CPS totals show the difference against the 4 CPS subtitled videos.

   Participants spent longer times reading subtitles in the 8 CPS condition. For example, participant E spent 62% of the viewing time on the image for the 4 CPS version of *Psycho*. In the case of the 6 CPS version, however, the total visit duration of the image was 17% less than that of the 4 CPS version. Both the longest and the shortest total visit duration of each subtitle rule were captured by women in their twenties (participants A and J) even though their English levels were roughly the same (over 800 with TOEIC score). On the whole, total visit duration of subtitles of *Black Swan* was shorter than that of *Psycho*. As discussed before, participants found the translation quality of *Black Swan* better. In addition, the average speed of dialogues was faster in *Psycho* (153 wpm) than *Black Swan* (145 wpm). These factors probably led to shorter reading times. The average reading time of subtitles for the experiment was 36.3 %.

   A Wilcoxon signed-rank test was carried out in order to compare the differences between the

traditional 4 CPS norm and the two other conditions. The significance level for this experiment was set at 0.05. As for *Psycho*, there was no significant difference between the 4 and 6 CPS subtitles (z = -1.7, p = .089, r = .12). Note that z indicates test statistics, p shows p-value and r refers to effect size. In the case of 8 CPS subtitles, however, the result was significant (z = -2.37, p = .018, r = .169), indicating that participants spent more time on reading subtitles than watching the projected images compared to the 4 CPS version. On the other hand, there was no significant difference among three subtitled videos *in Black Swan* (for 6 CPS, (z = -.17, p = .0865, r = .02) and for 8 CPS (z = -1.693, p = .090, r = .12)).

Table 4-2. Total visit duration (ratio in percentage) of subtitles and image for *Psycho* (n=7)

Participant	4 CPS		6 CPS		8 CPS	
	Image	Subtitle	Image	Subtitle	Image	Subtitle
A	78	22	81 (+3)	19 (-3)	76 (-2)	24 (+2)
E	62	38	40 (-22)	60 (+22)	45 (-17)	55 (+17)
F	66	34	70 (+4)	30 (-4)	42 (-24)	58 (+24)
G	71	29	54 (-17)	46 (+17)	61 (-10)	39 (+10)
H	55	45	47 (-8)	53 (+8)	48 (-7)	52 (+7)
I	68	32	64 (-4)	36 (+4)	67 (-1)	33 (+1)
J	50	50	46 (-4)	54 (+4)	35 (-15)	65 (+15)
Average	64.3	35.7	57.4 (-6.9)	42.6 (+6.9)	53 (-11.3)	47 (+11.3)

Note. Participants B, C, and D were excluded due to the scarcity of pupil data.

Table 4-3. Total visit duration (ratio in percentage) of subtitles and image for *Black Swan* (n=7)

Participant	4 CPS		6 CPS		8 CPS	
	Image	Subtitle	Image	Subtitle	Image	Subtitle
A	89	11	85 (-4)	15 (+4)	76 (-13)	24 (+13)
E	62	38	58 (-4)	42 (+4)	68 (+6)	32 (-6)
F	67	33	71 (+4)	29 (-4)	68 (+1)	32 (-1)
G	71	29	77 (+6)	23 (-6)	61 (-10)	39 (+10)
H	68	32	76 (+8)	24 (-8)	65 (-3)	35 (+3)
I	79	21	74 (-5)	26 (+5)	69 (-10)	31 (+10)
J	66	34	56 (-10)	44 (+10)	44 (-22)	56 (+22)
average	71.7	28.3	71 (-0.7)	29 (+0.7)	64.4 (-7.3)	35.6 (+7.3)

Note. Participants B, C, and D were excluded due to the scarcity of pupil data.

Taking a closer look at eye-tracking data, Figures 4-2 to 4-4 below show the gaze plot of each subtitling condition. They included four subtitles and the duration of the scene was 14 seconds. Bigger circles indicate longer fixation time. Fixation counts of each subtitling rule were 41 for 4

CPS, 51 for 6 CPS, and 59 for 8 CPS respectively. More texts led to more fixation counts and longer reading time. As can be seen, eyes moved to image only twice out of 51 counts in 8 CPS subtitles.

Considering total visit duration, participants did not have enough time to enjoy the videos when they were exposed to the 8 CPS subtitle of *Psycho*. With regard to *Black Swan*, however, no significant difference among the three subtitling conditions was observed. Based on the analysis of gaze plot, participants seemed to spend too much time reading the 8 CPS subtitles of *Psycho*. The results imply that the subtitles of 8 CPS condition are too long.
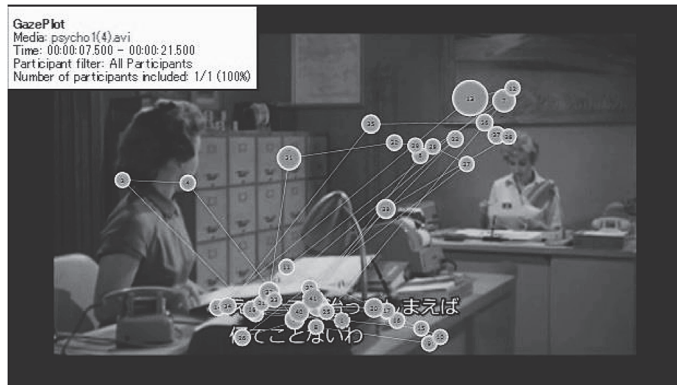

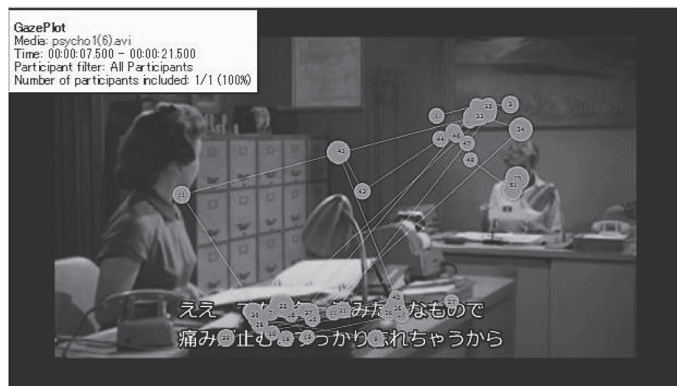*Figure 4-2*. Gaze plot (four subtitles): 4 CPS condition

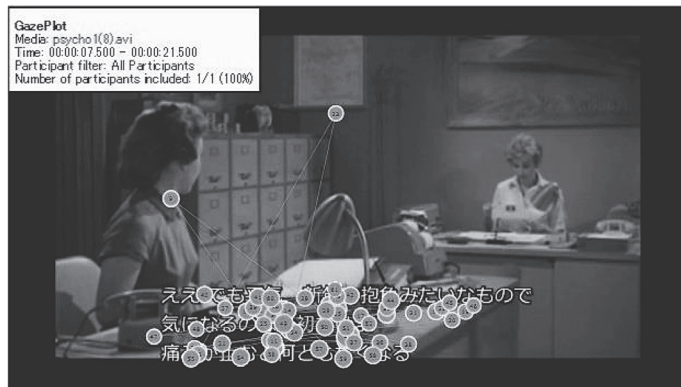*Figure 4-3*. Gaze Plot (four subtitles): 6 CPS condition

Figure 4-4. Gaze Plot (four subtitles): 8 CPS condition

5. Discussion

The 4 CPS condition is the current norm of the industry. Indeed, it is feasible to translate under this norm without veering off from the original dialogue. In addition, eye-tracking data showed that participants had plenty of time for both watching the projected images and reading subtitles. However, the participants of the current experiment were not fully satisfied with the 4 CPS rule of Japanese subtitle in terms of translation quality, echoing the previous study (Shinohara, 2013a). The number of participants who chose it as the most appropriate subtitle norm was the smallest among three experimental conditions.

The results of questionnaire suggested that the 8 CPS condition could also be enjoyable. However, the eye-tracking data showed that participants concentrated too much on reading subtitles under this condition, particularly when three-line subtitles were displayed. According to Shinohara (2013a), subtitlers aim at creating subtitles that can be readable and comprehensible for all the viewers and subtitles should not attract too much attention of the audience. Georgakopolou (2009) suggested the similar point, saying that the most successful subtitles are those that are not noticed by the viewer. Therefore, it can be concluded that the 8 CPS condition is not suitable because participants appeared to spend too much time on reading subtitles.

The number of participants who chose the 6 CPS condition as the most appropriate subtitling standard is the largest in the experiment. Eye tracking data (gaze plot) suggested that under this condition participants had enough time to watch the projected images. Furthermore, reading subtitles seemed not as difficult as the 8 CPS version. Since no participants complained about translation quality, it can be said that the 6 CPS condition is probably a strong candidate for a new CPS standard of Japanese subtitle.

6. Interviews with Professional Subtitle Translators

The results of the experiment imply that the current 4 CPS norm of Japanese subtitle may not be appropriate to viewers who are proficient at reading subtitles. To gain further insight from people involved in the industry, however, I interviewed two professional subtitle translators.

Translator A (interviewed on July 30, 2016) discussed her views on translation rules including the 4 CPS industry norm based on her ten years of experience. I explained her that my research suggested people could watch 6 CPS subtitles without being bothered by the amount of subtitles. She said:

> As far as I know, there has not been a movement for examining the current rule, nor have I never doubted it. It is true that small segments of the population prefer dubbing due to the fact that difficult logographic characters (kanji) or idioms prevent understanding of the story, particularly if the plot of the movie is complicated. On the other hand, those viewers who have advanced English skill can read faster than ordinary people, so they could comprehend more text.

Relating to the translation quality, I asked; "Have you ever felt that it could be more convenient if you could use more characters; for instance, one or two more kana-kanji characters in your Japanese subtitles?" She answered:

> There would be not much difference even if one or two characters per second were increased. Technically, it is possible to add one character by changing in-and-out timing; however, it is not encouraged and usually the duration is not affected.

Working also as a proof reader, she said these manipulations would not be allowed and would be revised. She continued:

> Movies themselves are complete and impeccable works, so subtitles should be minimal. Viewers feel frustration if subtitles are not readable in the time they are displayed. Subtitles that require viewers to concentrate too much on reading are not desirable. Otherwise, some important information of the movie may be missed.

In short, Translator A believes the current 4 CPS norm is appropriate. In contrast, Translator B (interviewed on August 29, 2016), who has been working as a subtitler for 28 years, had a different view:

> Firstly, subtitlers should translate original dialogues without considering word limitation. If

necessary, they can consider which parts or information need omitting or should remain. The cases when omission occurs are usually when actors speak fast or when there is plenty of information to take in.

I asked Translator B the same question regarding translation quality – whether more characters were needed when producing subtitles. She answered:

> For a more refined translation, I would only use more characters in order to avoid unfinished fragments such as *kare wa naniwo*? (What is he (doing)?) These are "conventional subtitles". A viewer mentioned this to me at one time.

According to her, this is based on the fact that more people can understand English nowadays compared to the past. "Conventional subtitles" refer to "unfinished sentences and grammatically unacceptable constructions" (Gottlieb, 1994). Since she mentioned viewers, I asked another question: Can you get opinions from spectators about your work?

> No, I do not surf the Internet where I may get opinions of spectators because not many opinions are constructive. It is possible that viewers feel that subtitles are not translated properly when what they hear does not appear in subtitles, so they perceive those subtitles as meaningless. As a professional subtitler, it is more important to respond to the demands of production companies. There is no use if production companies or clients are dissatisfied with subtitles.

I explained the result of my experiment that participants could comprehend more text, and that my research stood in contrast to Kagaya (2010) which suggested that young people seemed to have difficulty in reading subtitles. Translator B responded:

> Viewers can read more text if they try to, and I believe those people who prefer subtitled films are more trained and can read faster as they have been reading subtitles for many years. However, subtitlers have to take into account those elderly people who may get tired reading subtitles for a long time.

In short, Translator B did not completely agree with the current 4 CPS norm. Nevertheless, both Translators A and B are striving to produce clear and readable subtitles for all viewers under the current 4 CPS industry standard.

7. Conclusion

The 4 CPS Japanese subtitling norm was established in 1931. Since then a large number of foreign films were subtitled under this norm. However, few studies investigated on the appropriateness of this norm. In this study, two research questions were explored. The followings are summaries of my answers to these research questions:

RQ1. Is the current 4 CPS rule of Japanese film subtitling an outdated norm?

The current 4 CPS rule may be a bit outdated for today's audience, although it is not entirely so because original messages could be, and have been, translated properly even under this norm. Although Kagaya (2010) pointed out that young people had difficulty in reading subtitles these days, the participants in this study could enjoy watching subtitled films. When they watched 4 CPS subtitles, they had more time to concentrate on visual images. However, they felt that part of the original dialogue had been omitted. Data showed that viewers were not always satisfied with subtitles produced under the 4 CPS norm. Translation strategies applied in the subtitles used in the experiment were mostly *generalization*, *paraphrase,* and *omission* (Pedersen, 2005).

RQ2. What is the most appropriate norm of Japanese subtitling in terms of the number of characters per second?

As for Research Question 2, it was suggested that 6 CPS could be an optional choice. As Translator B suggested, translation quality could be improved if more characters were allowed to use. Also, more translation strategies can be applied and a greater variety of subtitles can be produced. In our experiment, participants spent most of the time reading subtitles when they were exposed to 8 CPS versions of subtitled movie. Georgakopolou (2009) suggested that the most successful subtitles are those not noticed by the viewer. The 8 CPS versions of subtitles, however, required too much attention of the viewers and therefore are considered inappropriate. In case of 6 CPS subtitles, all the participants could enjoy watching the films without being bothered by subtitles. Also, the participants were generally satisfied with the quality of translation under the 6 CPS condition. These results imply that both translators and audience could benefit if 6 CPS, with a degree of flexibility, was adopted as a new standard of Japanese subtitling.

8. Limitations and Future Studies

The sample size of the experiment was not large enough to generalize the findings. Due to time limitations, eye-tracking data was captured from only ten participants. A broader selection of age groups, including elderly people and small children, is necessary for future studies. The

English level of the participants was higher than the average, and this possibly led to deeper awareness of translation quality. Low level English learners or those who do not have rich lexical knowledge may not find omission of the original dialogue in the 4 CPS subtitles. In addition, films used in the experiment were of only one genre. Studies incorporating other film genres might result in different reactions from the experimental subjects.

All in all, the current study has clear limitations and one must be very cautious in making any generalizations from its findings. Nevertheless, the author hopes that the current study shed some new light on this relatively neglected area of inquiry.

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