Effectiveness of the Self-Administered Interview and Drawing Pictures for Eliciting Eyewitness Memories

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The Self-Administered Interview (SAI) is a tool that is used to obtain eyewitness memories. Adopting the techniques of the cognitive interview (CI), the SAI was developed in the form of a booklet consisting of several parts. The unique aspect of the SAI is a sketch section that asks eyewitnesses to describe the context of an incident by drawing pictures. This study investigates the effectiveness of the SAI by focusing on the effect of the sketch on memory recall. Participants ($n = 180$) watched a crime video and recalled events in a 3 (recall method: SAI, CI, free recall [FR]) $\times$ 2 (delay: immediate, one week) between-subjects design. The results showed no significant difference among recall methods when the information from the sketch was excluded. When the sketch information was included, the SAI gained better results than the CI and FR in terms of memory recall. In addition, memory performance was better for the immediate SAI compared with the delayed CI. The practical implications of the SAI are discussed.

Key words: crime; eyewitness memory; police investigation; sketch.

Introduction

Eyewitness statements play a critical role in criminal investigations in terms of revealing what happened at a scene and identifying the individuals involved in an incident. Thus, it is vital to record eyewitness recollections as soon as possible. It is assumed in general that human memories are robust and can therefore be recalled quite accurately (Kebbell & Milne, 1998). However, a number of studies have shown that memories are both fragile and fallible (Gabbert, Hope, & Fisher, 2009; Loftus, 1992). One example of this is the post-event information effect (Loftus & Pickrell, 1995; London, Bruck, & Melnyk, 2009; Paterson & Kemp, 2006). Memories can easily be contaminated by information encountered after witnessing an event. In the

famous study of Loftus and Palmer (1974), participants watched a video about a traffic accident and were then asked about the speed of the automobile at the time of the accident. When an experimenter asked participants how fast the car was going when it ‘hit’, the mean speed they reported was 34 mph, whereas when the experimenter used the word ‘smashed’, the mean speed reported was 41 mph. One week later, participants were asked if they saw broken glass in the car accident video. Among participants who were asked using the word ‘hit’, 14% responded that they saw broken glass, whereas among those who were asked using the word ‘smashed’, 32% responded that they saw it. However, broken glass was not present at all in the video.

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The post-event information effect can occur through various media such as co-witnesses (Gabbert, Memon, & Allan, 2003; Gabbert, Memon, Allan, & Wright, 2004; Skagerberg & Wright, 2008; Wang, Paterson, & Kemp, 2014), the mass media including social networking (Ost, Granhag, Udell, & Roos af Hjelmsäter, 2008), and actual interviews (Lane, Mather, Villa, & Morita, 2001). Memories also decay over time, and the details of information fade gradually, even if events are emotional (Lee & Hsu, 2013). Because eyewitness memories play a significant role in police investigations they must be collected as soon as possible before they become distorted (Hope, Gabbert, & Fisher, 2011; Pansky, 2012), otherwise they may lead investigations in the wrong direction. However, conducting an interview with appropriate witnesses can take time (Kebbell, Milne, & Wagstaff, 1999). In particular, when a number of people were at a scene, police must determine the best witnesses to the incident (Hope et al., 2011). Therefore, in such circumstances, time is consumed identifying and selecting eyewitnesses for interviews and a certain number of investigators are required.

The Self-Administered Interview

To overcome time and workforce constraints, a new interviewing tool has been developed to obtain high-quality eyewitness memories. The Self-Administered Interview (SAI) is an instrument that eyewitnesses complete themselves by writing about their memories in a booklet (Gabbert et al., 2009). Given its questionnaire format, the SAI can be distributed to multiple eyewitnesses at a scene simultaneously; therefore, police do not need to conduct brief interviews at the scene to invite eyewitnesses for formal interviews. Instead, they can review the completed SAI and select potential eyewitnesses for the formal interviews. In addition, because memory recall at an early stage can prevent a memory from being contaminated (Loftus, Levidow, &

Duensing, 1992), retrieving a memory using the SAI soon after the incident prevents the influence of post-event information (Gabbert et al., 2009; Hope et al., 2011). Consequently, eyewitnesses are better able to retrieve accurate information later during a formal interview with police.

The SAI is composed of seven sections containing written instructions about what the eyewitness is requested to report. Section A begins with the instructions for a mental reinstatement of the context of the incident, followed by a report of everything about the incident as accurately and completely as possible without using one's imagination or receiving help from others. Section B is about the persons involved in the incident. Some cues regarding persons – such as gender, height, weight, hair colour, clothing, and glasses – are offered to help eyewitnesses recall details about the persons involved. In section C, the eyewitness draws a picture to describe the scene that can include labels and arrows to indicate the position or direction of movement of both objects and people. The instructions note that the purpose of the sketch is not to test drawing ability but to provide police with information about the scene. Section D asks about other people who were present at the scene and who might also have witnessed the incident. Section E asks for a report about the vehicles involved and includes retrieval cues about vehicles such as size, shape, colour, and model. Section F contains several open-ended questions regarding the conditions for the eyewitness, such as time, weather, the presence of any obstructions and the duration of the observation. In section G, the eyewitness provides any other relevant information not reported in the other sections.

The SAI was developed based on the cognitive interview (CI), which is an effective interviewing tool for eliciting accurate information (Fisher & Geiselman, 1992; Geiselman et al., 1984). The underlying principles of the CI are fundamental theories in the field of memory and cognition (Maras, Mulcahy,

Memon, Picariello, & Bowler, 2014). The CI involves four techniques: mental reinstatement of the context, the instruction to report everything, change of incident order (reporting an incident in a different order of events such as from end to beginning), and change of perspective (reporting an incident from different perspectives such as victims' or perpetrators' perspectives). Rapport-building with interviewees is also critical for making eyewitnesses feel comfortable reporting during the interviews. The CI also employs open-ended questions, during which interviewers ask some questions of interviewees. The first two techniques – mental reinstatement of the context and the instruction to report everything – are the most effective techniques (Milne & Bull, 2002) that can be successfully administered to children (Holliday, Reyna, & Hayes, 2002; Milne & Bull, 2003) and elderly persons (Prescott, Milne, & Clarke, 2011). The SAI incorporates these two techniques and begins with the mental reinstatement of the context by providing written instructions so that eyewitnesses are able to go back to the scene mentally and recall information well about the event. Because all the instructions are written in the booklet, the SAI does not require special techniques to administer (Hope et al., 2011). On the other hand, the CI requires interviewers to receive special training to learn the interviewing techniques for administration (Fisher, Geiselman, & Amador, 1989). Therefore, the SAI enables the acquisition of high-quality memories from multiple eyewitnesses simultaneously without the cost of training special interviewers (for a review of the SAI, see Hope et al., 2011).

The effects of the SAI on memory recall have been investigated in several psychological studies (Gabbert et al., 2009; Mackay & Paterson, 2015; Maras et al., 2014; Roos af Hjelmsäter, Strömawall, & Granhag, 2012). Individuals show better recall when their memories are elicited by the SAI compared with a free recall (FR) method (Gawrylowicz, Memon, & Scoboria, 2014). Gabbert et al.

(2009) compared the number of correct items when using the SAI, the CI, and FR. Participants watched a video clip of a non-violent attempt to break into a car, which lasted 2 minutes and 40 seconds, and then reported what they saw using one of the three recall methods. The number of correct items was about the same between participants using the SAI and the CI, which were significantly higher than the number of correct items yielded by the FR method. The accuracy rate was lower for the SAI compared with the CI, and there was no significant difference between the SAI and FR. The recalled items were also analysed based on the types of information: person, object, setting, and action. The results were similar to those for the total number of correct items and the total accuracy rate, such that the SAI and the CI elicited more correct items than FR for all four categories, while no significant difference was found between the SAI and the CI. Regarding the accuracy rates, the CI was significantly better than the SAI and FR for the person and action categories whereas no significant difference was found among the three recall methods for the setting and object categories. The results indicate that the SAI elicits as much correct information as the CI.

Other studies have also demonstrated the effects of the SAI on memory retention. When individuals recalled their memories using the SAI soon after the incident, they showed better memory performance on subsequent retrieval one week later compared with those who did not have an opportunity to recall soon after the incident (Gabbert, Hope, Fisher, & Jamieson, 2012). This retention effect appeared even when a stressful event was witnessed (Gittins, Paterson, & Sharpe, 2015) and when the witnesses were 11- and 12-year-old children (Roos af Hjelmsäter et al., 2012). In addition, when individuals recalled their memories using either the SAI or FR soon after watching the video, those who used the SAI better retrieved their memories one week later than those who used FR

(Hope, Gabbert, Fisher, & Jamieson, 2014). These studies suggest that although early retrieval opportunities are important for memory retention, the systematic recall of the SAI offers a greater advantage than the ordinary recall of FR. Furthermore, other studies have shown an effect of the SAI on the influence of post-event information. Mock eyewitnesses who completed an immediate recall through the SAI were less vulnerable to the influence of misleading information than those who did not have this recall opportunity (Gabbert et al., 2012). The protection from the influence of post-event information was found to still be effective when the SAI was administered 24 hours after the incident (Paterson, Eijkemans, & Kemp, 2015).

In addition, Maras et al. (2014) compared the SAI and structured recall (SR) for information about an incident and conducted two different analyses – one for the entire SAI including the sketch section and the other for the information elicited in the sketch section only. The SR was prepared using a booklet containing the same number of questions included in the SAI, the key difference between the SAI and the SR being that the SR did not include the instructions for context reinstatement as well as cued items that facilitate recall of memories. In addition, although the SR asked participants to describe the situation they witnessed, they did not have an opportunity to draw a picture and had to provide information in words. The results showed that the SAI was better for eliciting memories than the SR, and more accurate information about the situation was elicited by sketching a picture than by writing in words. Thus, the results suggest the effectiveness of sketching to illustrate a situation.

While a number of studies have indicated the effectiveness of the SAI for eliciting high-quality memories and preventing forgetting and memory contamination, the SAI has been adopted by the Greater Manchester Police of the United Kingdom for investigations of major incidents involving multiple

eyewitnesses. One important note is that the SAI is not intended to replace formal interviews; rather, its aim is to provide an effective recall tool that facilitates police investigations before conducting formal interviews (Gabbert et al., 2009). The SAI, which was originally developed in English, has been translated into several languages such as German, Dutch, and Norwegian, and various versions have been studied throughout the world (Hope et al., 2011).

The Present Study

Following the study of Gabbert et al. (2009), the present study investigated the effect of the SAI on memory retrieval in Japan by comparing memories elicited by the CI and FR, with a particular focus on the information elicited from the sketch section of the SAI. In Gabbert et al. (2009), the information elicited from the sketch section was not included in the analysis; therefore, not all the information elicited from the SAI was compared with that elicited from other instruments. Also, although Maras et al. (2014) found an effect of drawing a picture to elicit information about the situation of an incident by comparing the SAI and the SR in a booklet form, eyewitnesses usually report what they saw verbally and not in writing. Accordingly, the present study presented two different data sets – one with information elicited from the sketch section and the other without this information. Along with the practical implications, the present study examined the effects of the SAI with and without the sketch information by comparing the CI as an effective interviewing tool and using FR as a control. In addition, the studies of both Gabbert et al. (2009) and Maras et al. (2014) did not include information from sections F (witnessing conditions) and G (other information not mentioned in other sections). The present study included information from all seven sections of the SAI in the analysis.

By including a delay factor in the experiment, immediate versus a one-week delay,

the present study also made a direct comparison between the immediate SAI and the delayed CI for a practical purpose. The CI (or a formal interview) is usually conducted sometime after an incident while the SAI can be administered immediately after the incident; thus, this planned analysis was conducted in the context of ecological validity for police investigations.

Hypotheses

It was hypothesized that the memory retrieval using the SAI would be about the same as that using the CI but better than that using FR when information recalled in the sketch section is not included. However, when information recalled in the sketch section was included, memory performance on the SAI would be better than that for other recall methods. Moreover, because the sketch section in the SAI ostensibly demands eyewitnesses to provide details about the situation by drawing a picture, information concerning an incident scene would be provided to a greater extent by using the SAI than using the CI and FR.

It was also hypothesized that memory performance would be better for the immediate SAI compared with the delayed CI because early recall elicits more information than delayed recall (Pansky, 2012). This hypothesis is based on the assumption that the SAI is as effective as the CI.

Method

Participants

A total of 180 undergraduate and graduate students (78 males, 104 females) aged between 18 and 58 years ($M = 22.13$, $SD = 4.94$) participated in the study. Participants received 900 or 1400 yen (approximately \$US8 or \$US13, respectively), with those in the one-week delay condition receiving the larger amount.

Design

A 2 (delay: immediate, one-week delay) $\times$ 3 (recall method: SAI, CI, FR) between-subjects design was used. The experiment was conducted with one participant at a time. Participants were randomly assigned to one of the six conditions.

Materials

Video

The video of a fictional attempt to break into a car (lasting 2 minutes 40 seconds) used by Gabbert et al. (2009) was employed in the present study. In the video, three perpetrators walk around a parking lot looking for a car to break into. Several passers-by go through the lot but do not pay attention to the perpetrators, who choose a target car and try to break into it but are unsuccessful and dissipate as the car's owners return. There are no violent scenes in the video.

The Self-Administered Interview (SAI)

In order to construct a Japanese version of the SAI, two Japanese–English bilingual individuals independently translated the original version of the SAI into Japanese. The translated words and sentences were examined by comparing the two translations word for word. The layout as well as the number of pages in the booklet are exactly the same as the original version of the SAI. The information provided in all seven sections was used for the analysis.

The Cognitive Interview (CI)

Two interviewers received training for conducting the CI (except the Change Order and Change Perspective sections) in the experiment. After learning about the theories underlying the CI techniques, they practised the interview with several mock eyewitnesses as preliminary experiments, specifically building rapport with an interviewee, asking open-

ended questions, and received feedback from trainers.

Free Recall (FR)

FR was conducted on a paper basis. A simple instruction such as 'please report everything about the video in your own words' was printed at the top of a first sheet stapled to another blank sheet.

Procedures

The experiment followed the study procedure of Gabbert et al. (2009). After signing the consent form, participants watched the video on a 14" high-definition (HD) PC monitor. The video was viewed without giving any specific instructions in order to recreate the typical circumstances in which an event happens to be witnessed. After viewing the video, participants in the immediate condition moved to a different room and recalled their memories using the SAI, the CI, or FR. Participants in the delay condition were dismissed after watching the video and returned one week later to recall their memories about the video using the SAI, the CI, or FR in a room different from the one in which they watched the video. No time limit was imposed on memory retrieval for participants in all conditions. Participants in the SAI condition also responded to a questionnaire regarding the usability of the SAI. They were debriefed and thanked at the end of the experiment.

Item Coding

Item coding was conducted in accordance with the coding list of Gabbert et al. (2009). The list comprises 699 pieces of information consisting of person (P), object (O), setting (S), and action (A). Each coded item was counted as either correct (when the item was shown in the video) or incorrect (when the item was not shown in the video). For example, a statement was coded as 'a man (P-1)

walked (A-1) towards (S-1) a red (O-1) car (O-1)'. Subjective descriptions (e.g. 'he was unattractive') were not counted. All items were counted only once, even if the same items appeared in different statements. Items provided by participants in the SAI condition were also summed in two ways: (1) items provided in the SAI except the sketch section (without sketch), and (2) items provided in all sections of the SAI (with sketch). Items provided in the sketch section were counted at the end and added to the score of the without-sketch section to calculate the score for the with-sketch section. Therefore, the items in the sketch section were counted if they appeared for the first time in the SAI and were omitted if they were already provided in other sections, even if the sections followed the sketch section.

Data coding were conducted by two independent coders. With a random selection of 24 interviews, the inter-coder reliability for total correct items was high, $r = .97$, $t(22) = 18.96$, $p < .001$.

Results

Usability of the Japanese version of the SAI

Among 60 participants who completed the SAI booklet, none indicated that the questions and statements printed in the Japanese version of the SAI are ambiguous. Rather, they responded that the statements are all clear and understandable.

Analysis for the Without-Sketch Section

To assess the main effects of delay and recall method and their interaction, analyses of variance (ANOVAs) were conducted for all analyses. Tukey *post hoc* tests were also conducted to examine differences among the SAI, the CI, and FR when a significant main effect of recall method was found.

There was a significant main effect of delay, $F(1, 174) = 17.95$, $p < .001$, $\eta^2 = .09$, but no significant main effect of recall

method, $F(2, 174) = 2.20, p = .11$, and no significant interaction between delay and recall method, $F(2, 174) = 1.27, p = .28$, in relation to the number of correct items recalled. The analysis revealed that the number of correct items was significantly greater when they were recalled immediately after watching the video compared to one week later. However, there was no difference in the number of correct items among the three recall methods when the sketched information was excluded.

The analysis also revealed a significant effect of delay, $F(1, 174) = 9.43, p = .002, \eta^2 = .05$, and a significant effect of recall method, $F(2, 174) = 10.43, p < .001, \eta^2 = .10$, but no significant interaction between delay and recall method, $F(2, 174) = 0.08, p = .93$, in relation to the accuracy rate. The accuracy rate was higher for immediate recall compared with delayed recall. When the items recalled in the sketch section were excluded, the accuracy rate was also higher when memories were recalled using the CI ($p = .001$) and FR ($p < .001$) compared with the SAI. There was no significant difference between the CI and FR for accuracy rate ($p = .92$).

Analysis for the With-Sketch Section

Including all items recalled in the SAI together with the sketch section, the number of correct items and accuracy rate were assessed to reveal the effect of delay and recall method.

The results showed a significant effect of delay, $F(1, 174) = 19.44, p < .001, \eta^2 = .08$, such that the number of correct items was higher for immediate recall than delayed recall. A significant effect of recall method was also found, $F(2, 174) = 19.47, p < .001, \eta^2 = .16$, in relation to the number of correct items, which was larger for the SAI compared with the CI ($p < .001$) and FR ($p < .001$), with no significant difference between the CI and FR ($p = .40$). No significant interaction between delay and recall method was found, $F(2, 174) = 1.86, p = .16$. The results

indicated that, contrary to the analysis for the number of correct items without the sketch section, participants recalled more correct information when using the SAI compared to the CI and FR when the information provided in the sketch section was included. This suggests that the sketch has an impact on eyewitness memory recollection.

For the accuracy rate, there was a significant effect of delay, $F(1, 174) = 10.33, p = .002, \eta^2 = .05$, and a significant effect of recall method, $F(2, 174) = 5.87, p = .003, \eta^2 = .06$, but no significant interaction between delay and method, $F(2, 174) = 0.09, p = .92$. The accuracy rate was higher for immediate compared with delayed recall. *Post hoc* comparisons among the three recall methods revealed that the accuracy rate was higher for the CI ($p = .02$) and FR ($p = .005$) compared with the SAI, but no significant difference was found between the CI and FR ($p = .91$).

Overall, the results indicated that although the total number of correct items did not differ among the three recall methods when the sketch information provided in the SAI was not included, the total number of correct items was significantly greater for the SAI compared with the other two methods when the sketch information of the SAI was included. Therefore, the effect of the sketch was demonstrated. All means and *SDs* examined in the statistical analysis are shown in Table 1 along with the means and *SDs* for each category (person, object, setting, and action) within each recall method.

Analysis of Information about the Setting

The sketch section in the SAI ostensibly asks eyewitnesses to describe the situation by drawing a picture, while the CI and FR do not provide this opportunity. The present study examined how much information about the setting is provided by comparing the SAI, the CI, and FR – namely, the effect of the sketch on situational information. The results demonstrated no significant effect of delay, $F(2, 174) = 0.16, p = .69$, but a significant effect

Table 1. Means number of correct items and accuracy rate recalled for each condition.

Details	Immediate				Delayed			
	SAI with sketch	SAI without sketch	CI	FR	SAI with sketch	SAI without sketch	CI	FR
Person								
Correct	47.80 (16.04)	45.83 (15.93)	34.73 (12.95)	34.87 (18.93)	34.53 (11.00)	33.20 (10.56)	30.17 (13.05)	25.63 (8.72)
Accuracy rate	0.88 (0.06)	0.89 (0.06)	0.92 (0.06)	0.93 (0.05)	0.87 (0.08)	0.87 (0.08)	0.89 (0.07)	0.90 (0.06)
Action								
Correct	11.37 (5.13)	9.93 (5.07)	11.93 (5.22)	12.37 (5.57)	7.77 (3.14)	6.70 (2.98)	9.27 (4.23)	9.37 (3.53)
Accuracy rate	0.93 (0.10)	0.93 (0.11)	0.95 (0.11)	0.96 (0.09)	0.88 (0.16)	0.87 (0.17)	0.94 (0.08)	0.91 (0.12)
Object								
Correct	7.07 (3.15)	5.97 (2.63)	5.93 (3.72)	5.13 (2.56)	4.43 (2.22)	3.60 (1.79)	4.17 (2.20)	3.63 (1.97)
Accuracy rate	0.87 (0.11)	0.87 (0.13)	0.92 (0.11)	0.97 (0.08)	0.75 (0.24)	0.73 (0.24)	0.86 (0.19)	0.91 (0.15)
Setting								
Correct	16.00 (6.43)	3.00 (2.73)	3.53 (3.15)	2.17 (1.97)	13.43 (6.04)	2.47 (1.11)	5.73 (4.93)	1.87 (1.46)
Accuracy rate	0.96 (0.05)	0.97 (0.10)	0.95 (0.09)	0.99 (0.04)	0.93 (0.10)	0.99 (0.04)	0.93 (0.19)	0.95 (0.15)
Total								
Correct	82.23 (25.53)	64.73 (23.55)	56.13 (22.05)	54.53 (27.06)	60.17 (18.08)	45.97 (14.07)	49.40 (21.62)	40.50 (13.17)
Accuracy rate	0.90 (0.05)	0.89 (0.05)	0.93 (0.06)	0.94 (0.06)	0.87 (0.07)	0.86 (0.08)	0.90 (0.05)	0.90 (0.06)

Note: CI = cognitive interview; FR = free recall; SAI = Self-Administered Interview. SDs are in parentheses.

of recall method, $F(2, 174) = 134.57, p < .001, \eta^2 = .60$, in relation to the number of correct items. It was highest for the SAI, followed by the CI and FR. There was a significant difference between the SAI and the CI ($p < .001$), the SAI and FR ($p < .001$), and the CI and FR ($p = .006$). A significant interaction of delay and recall method, $F(2, 174) = 4.30, p = .02, \eta^2 = .02$, was also found. While the number of correct items decreased for the SAI and FR from immediate to delayed recall, it increased for the CI.

The results also revealed a marginally significant effect of delay, $F(1, 174) = 3.14, p = .08$, no significant effect of recall method, $F(2, 174) = 0.86, p = .43$, and no significant interaction, $F(2, 174) = 0.13, p = .88$, in relation to the accuracy rate. In sum, the effect of the delay on information about the situation was not robust while the effect of the recall method was significant, such that the SAI elicited a greater amount of information about the situation compared to the CI and FR.

Planned Analysis between the Immediate SAI and Delayed CI Conditions

To compare memory performance between the immediate SAI and delayed CI conditions, planned analyses were conducted. Incorporating all the information together with the sketch section, the results showed that the immediate SAI performed better than the delayed CI for the number of correct items, $F(1, 58) = 28.91, p < .001, \eta^2 = .33$, but there was no significant difference in accuracy rates, $F(1, 58) = 0.06, p = .81$. The same results were found when information recalled in the sketch section was excluded.

Discussion

The present study examined the effect of the SAI on memory recall in comparison with CI and FR methods. When the information elicited in the SAI sketch section was included in the analysis, the number of correct items was greater for the SAI compared with the CI

and FR. This implies an effect of the sketch on eliciting eyewitness memories. Depicting aspects of a situation, such as positional relations, directions of movement, and complicated shapes of objects, may be easily accomplished through drawing compared with writing. The finding that the SAI elicited more information than the CI and FR highlights the advantages of using a sketch for eliciting eyewitness memories.

The accuracy rate was lower for the SAI than for the CI and FR, and this occurred both with and without the sketch information. This finding corresponds with that of Gabbert et al. (2009). An increase in the amount of memory retrieval may cause an increase in both accurate and inaccurate information. The lower accuracy rate for the SAI suggests that the amount of inaccurate information elicited by the SAI is at least the same as the amount of accurate information. Therefore, keeping inaccurate information to a minimum while enhancing more accurate information is a goal of future studies.

The total number of correct items was larger for the immediate SAI compared with the delayed CI, indicating that implementing the SAI immediately after the incident enables the acquisition of more accurate information than conducting the CI at some point after witnessing the incident. This was also true when the sketch information of the SAI was excluded. This finding suggests a practical implication of the SAI for police investigations. It may be difficult for police to conduct formal interviews with potential eyewitnesses soon after incidents due to a lack of human resources. Conducting interviews with multiple eyewitnesses requires time and several interviewers (Hope et al., 2011). Because interviewing at a later time can cause memory decay and contamination through post-event information (Loftus & Pickrell, 1995; Pansky, 2012), administering the SAI soon after an incident is beneficial when human resources are limited.

Furthermore, human resources issues may also pertain to the language of the interview.

Because of cultural diversity within countries, individuals who do not speak the country's official language may frequently be eyewitnesses for incidents, making communication between the eyewitnesses and interviewers difficult. Moreover, it may take a long time to find interpreters to assist in interviews. However, the SAI does not require social interaction in order to be administered; therefore, eyewitnesses who do not understand the language of the country can respond to the SAI if it is available in their language. Because delayed recall exacerbates the amount and quality of information that is recalled (Pansky, 2012), the SAI can help eyewitnesses who do not have a good grasp of the native language to write down their memories in their first language before a formal interview is conducted with an interpreter.

Limitations and Conclusion

There are several limitations to the study. While the SAI is in booklet form, and all questions are already prepared and fixed, the CI is an interview that is conducted dynamically in person; therefore, the CI offers more flexibility in questioning. Investigators can ask eyewitnesses to describe the situation by drawing a picture and ask further questions about the pictures drawn during the interview. However, present participants in the CI condition were not asked to draw a picture about the scene, and no one spontaneously drew a picture to describe the situation. Therefore, if the interviewers in the present study asked them to sketch the scene, the CI might elicit more information compared with the SAI.

Second, although the experimenters received appropriate training to conduct the CI in the present study, their skills may not have been of comparable quality to those of the experimenters in the study of Gabbert et al. (2009). Although the mean difference in the total number of correct items recalled using the SAI in the present study (in the

immediate condition without-sketch section) and in the past study is 5.97, the mean difference for the CI is 28.40. The number of correct items recalled is higher for both the SAI and the CI in the past study compared to the present study. The matter of the quality of skills and techniques used to conduct the CI may have been a main cause of the non-significant difference among the three recall methods in the present study. Because the CI involves face-to-face communication and does not impose limitations on questioning, as long as techniques are maintained appropriately, the amount of information recalled through the CI should at least be larger than that elicited from FR. Thus, it can be assumed that the CI interviewers in the present study did not conduct the interviews effectively enough to elicit memories from participants (for details of CI techniques, see Fisher & Geiselman, 1992).

In a similar vein, the failure to replicate past results as well as the non-significant difference among the three recall methods for the number of correct items in the present study may have been due to the characteristics of participants; participants in the present study were recruited from several university campuses whereas those in Gabbert et al. (2009) were from a single campus. This may have led to variation in characteristics such as cognitive ability and motivation, and these dissimilarities may have been related to the results for memory performance. Indeed, the SDs of the total number of correct items are different between the past and present studies (for the immediate condition without-sketch section): 20.46 (vs 23.55) for the SAI, 21.66 (vs 22.05) for the CI, and 14.00 (vs 27.06) for the FR (numbers in parentheses are for the present study). In addition, as mentioned above, the mean differences in the number of correct items recalled for the immediate CI and immediate SAI conditions are higher in Gabbert et al. than in the present study; however, the mean number of recalled items for the immediate FR condition is 13.03 points higher in the present study than in Gabbert

et al. Thus, the current participants seemed to perform much better on the FR condition than those in Gabbert et al., and they also performed as well as participants of present study on the other conditions. Participants in the present study were randomly assigned to one of three recall methods; therefore, the reason for the high recall on the FR condition is unknown.

The present study demonstrated the effect of the SAI, especially the effect of the sketch included in it. The present study also found that when the SAI was conducted immediately after the incident, more information was elicited compared with when the CI was conducted one week after the incident. To solve a crime it is important to obtain eyewitness recollections as soon as possible, and the SAI can be a helpful tool for police to use to acquire quality memories quickly from eyewitnesses. In addition, when the SAI is prepared in various languages, it can be useful for individuals who are not well versed with the country's native language.

Acknowledgements

The authors would like to thank F. Gabbert, L. Hope, and R. P. Fisher for giving us advice to develop the SAI in Japanese language and for sharing experiment materials with.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by Japan Society for the Promotion of Science MEXT KAKENHI [grant number 26101705].

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