Computers in Human Behavior Reports 5 (2022) 100159

Contents lists available at ScienceDirect

Computers in Human Behavior Reports

journal homepage: www.sciencedirect.com/journal/computers-in-human-behavior-reports

Examining the efficacy of a digital version of the Self-Administered Interview☆

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ARTICLE INFO

Keywords:
Self-administered interview
Computer
Mobile device
Digital
Information elicitation

ABSTRACT

Objectives: The Self-Administered Interview (SAI©) is an investigative tool designed to facilitate the reporting of comprehensive initial statements by witnesses. Given increasing use of technology to communicate, many witnesses may prefer to provide investigators with accounts of what they have seen using online or mobile reporting platforms. Research shows that the SAI© elicits more accurate information from witnesses than other reporting formats. To date, however, the SAI© has only been tested in a paper-based format. The aim of the current research was to examine whether the benefits of the SAI© for witness reporting extend to digital reporting formats.

Method: In two experiments, we examined whether completing the SAI© on a computer or mobile device (as opposed to using a paper-based format) had any effect on the quantity or quality of information reported by mock witnesses. We also assessed whether the format of the initial report had any impact on performance in a delayed recall test.

Hypotheses: Based on available research on use of technology, we expected that witness accounts would be shorter when provided via mobile devices than via other formats. Drawing on past research outlined in the Introduction, we predicted that less detailed initial accounts would affect the quality of subsequent accounts.

Results: We found no differences between computer, mobile, or paper-based formats with respect to the quantity or quality of information reported in the SAI© or content of follow-up reports collected one-week later.

Conclusion: The findings suggest that administering the SAI© in online or mobile formats is unlikely to be detrimental to witness reporting. Given the time and resource costs associated with paper forms, as well as the additional functionality that digital presentation may afford, a digital SAI© may prove to be a useful investigative tool.

1. Introduction

Incidents involving multiple witnesses present police forces with significant challenges. Finite resources mean that not all witnesses can be interviewed promptly. For example, following the terrorist attack at a concert in Manchester in May 2017, over 2000 witness statements were collected over an extended period of time (Pidd, 2018). After a delay, witnesses may struggle to access fine-grained details about the incident (Goldsmith et al., 2005), and they may have difficulty identifying the source of retrieved details (Horry et al., 2014). In response to such challenges, Gabbert et al. (2009) developed the Self-Administered Interview (SAI©), which is a standardized protocol of instructions, open-ended questions and non-leading cues that enable cooperative witnesses to provide a detailed statement independently, without the need for a police officer to be present to conduct an interview.

A recent meta-analytic review by Horry et al. (2021) found that the SAI© elicits more correct details from witnesses than other reporting formats, with a slight cost to overall accuracy. Initial completion of an

☆ Author note. Fiona Gabbert and Lorraine Hope's work in writing this article was part funded by the Centre for Research and Evidence on Security Threats (ESRC Award: ES/N009614/1). Data collection for Experiment 2 was funded by an award from the Cherish Digital Economy Centre at Swansea University (Award number 49C). The funding sources had no other role other than financial support. We would like to acknowledge Zandalee Walters, Farhana Begum, Georgina Waterworth, and Megan Handscomb for their assistance with data collection.

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https://doi.org/10.1016/j.chbr.2021.100159
Received 5 August 2021; Received in revised form 19 October 2021; Accepted 24 November 2021
Available online 30 November 2021

SAI© was also found to reduce forgetting, leading to subsequent accounts that were more detailed and accurate for witnesses who had completed an initial SAI© than for those who had not. Research has also found that witnesses who complete an SAI© are more resistant to post-event misinformation (Gabbert et al., 2012; Gittens, Paterson, & Sharpe, 2015). Interestingly, Gawrylowicz et al. (2013) observed a 'transfer effect', whereby reporting about one event using the SAI© enhanced subsequent reporting about another unrelated event (see also Gawrylowicz et al., 2014). In sum, the SAI© is an effective tool for capturing detailed initial accounts and for preserving witness memory until a formal investigative interview can be conducted.

To date, the SAI© has only been systematically tested in its original low-tech format - a paper form to be completed by witnesses by hand. There several advantages to this format; (i) it is relatively foolproof in terms of dissemination and retrieval, as paper forms can be numbered, tracked, and logged; (ii) it generates an immediate tangible product available for review by investigators, and; (iii) it requires no special equipment or skills to complete (other than basic literacy). However, there are also some disadvantages to this format; (i) paper copies of the form needed to be printed in advance and carried by officers so that they are immediately available for use, with associated repercussions in terms of cost and space; (ii) printed materials come with resource and environmental costs; (iii) modes of communication are evolving and advances in hardware (e.g. computers, mobile phones) and software mean that people increasingly conduct their communications with others online (Ofcom, 2018a). This shift away from hand-written communication (Chemin, 2014) is true for both younger and older adults in the UK (Ofcom, 2018b), and in the US (Anderson & Perrin, 2017).

While digital completion of the SAI© may be a preferred form of reporting for many witnesses, there are several factors to consider before proceeding in this direction. The first is simply that the reported benefits of completing an SAI© are currently restricted to the original (pen-and-paper) tested format. Another factor to consider is the potential effect of different reporting formats on cognition. Specifically, the nature of the initial retrieval attempt may affect subsequent reporting of memory for the witnessed event. The SAI© has been shown to protect witnesses' memories from decay and distortion during the retention interval between an event and a follow-up interview (Horry et al., 2021). However, this effect may be contingent on the quality of the initial retrieval attempt. Research suggests that it is the act of engaging in a high-quality initial recall that can preserve episodic memory and thus enhance performance in a delayed recall attempt (see Hope et al., 2014; Marsh et al., 2005; Suengas & Johnson, 1988). Further, the act of recalling an incomplete subset of information from an episodic memory can sometimes impair one's ability to subsequently recall the remaining (unrecalled) items of information (Murayama et al., 2014; Shaw et al., 1995). Typical communications online, particularly via mobile devices (e.g., SMS, Instant Messenger), tend to be quite short and informal (Frehner & Lang, 2008). A concern therefore exists that if a digital SAI© similarly encourages shortened or otherwise limited reporting, then not only would less information be reported at this initial stage of an investigation, but these shorter initial accounts may not afford the same subsequent benefits as a lengthier handwritten account. Alleviating this concern somewhat is the observation in other domains that although responses to open-ended questions collected by mobile formats are often shorter in length, the quality of such responses is not impaired (e.g., Cocco & Tuzzi, 2012). For example, Walsh and Brinker (2016) compared responses to survey questions completed in four different formats: email, online, SMS, and paper-based, and found that while SMS responses were shorter in total length than other formats, they were no less informative or accurate.

To address these issues, the current research had two main objectives; first, to determine the relative quantity and quality of information provided by mock witnesses when completing the SAI© online on a computer, via a mobile device, or in the original paper and pencil format; second, to examine whether the initial reporting format had any impact on performance on delayed recall one week later. Two studies are reported; the second study sought to replicate the findings of Experiment 1, with the addition of a Control Group against which we could compare the performance of the SAI© groups.

Experiment 1

1. Method

2.1. Participants and design

A 3 (Format of SAI©: paper SAI©, mobile SAI©, computer SAI©) x 2 (Time of Interview: immediate, one-week delay) mixed design was used, with SAI© format as the between-subjects factor and time of interview as the within-subjects factor. The Ethics Committee at [redacted] University granted ethical approval for the research. A total of 88 participants were recruited. All participants signed informed-consent forms prior to participation. Approximately two-thirds were from the local community and received a small honorarium for taking part. The remaining participants were students who received course credit. All participants (72 = female; 16 male) were fluent in English with an average age of 31.18 years (SD = 15.45; range = 18–77 years). Participants were allocated randomly to complete the SAI© by hand (n = 34), using a computer (n = 32), or using a mobile/smart phone (n = 30). Eight participants were excluded from the analyses as they did not complete the delayed interview; three from the paper SAI© condition, one from the computer SAI© condition and four from the mobile SAI© condition (thus, final cell sizes were 31, 31, and 26 for paper, computer, and mobile conditions respectively). The dependent measures were the number of correct and incorrect details and the accuracy rate of information reported in each session.

2.2. Materials

2.2.1. Stimulus event. The stimulus event was a short video (2 min 12 s) depicting a non-violent robbery recorded on security CCTV. The film shows three perpetrators stealing items from a clothing store. The film was shown individually to all participants on a computer screen using high definition settings.

2.2.2. Self-Administered Interview (SAI©). The SAI© (Gabbert et al., 2009) comprised seven sections (Sections A-G) containing information and instructions designed to facilitate both recall and reporting of memories for a witnessed event. Briefly, Section A [What Happened?] encourages the participant to visualize the event in relation to where they were, what they saw and what they were thinking and feeling at the time before asking for a detailed free recall account of the event. This section of the SAI© maps onto the Context Reinstatement and Report Everything mnemonic components of the Cognitive Interview (CI; Fisher & Geiselman, 1992). Section B [Who committed the crime?] asks witnesses to provide as much detail as possible about the perpetrators' appearance (e.g., hair, build, distinguishing features, etc.). Section C [The scene] asks witnesses to generate a sketch of the scene to elicit important spatial information. Section D [Other people present] asks witnesses to provide details of any other potential witnesses. Section E [Vehicles involved] asks about details of any vehicles that were present. Section F [How well did you see the incident?] asks the participants to consider the conditions in which they witnessed the event, such as whether their view was obstructed. Section G [Other information] asks witnesses to provide any other details they may have remembered through the course of completing the SAI©. Instructions throughout prompted participants to provide the most complete and accurate account possible while avoiding guesswork.

For the computer and mobile reporting formats, all sections of the SAI© (with the exception of the sketch instruction in Section C) were

uploaded using the Qualtrics platform to generate an online link accessible on computers and mobile devices.

2.2.3. Additional measures. Measures are available in the Supplementary Materials folder (see https://osf.io/h7rqd/?view_only=e790ffa8373e401bb81cc3a96e1b19fe).

A **usage survey** comprising 13 items was designed to examine how frequently participants used computer and mobile devices. Participants rated the frequency with which they used each device for each of 13 activities on a 7-point Likert scale from 'never or almost never' to 'several times a day'. Examples activities included 'online shopping', 'instant messaging (e.g., WhatsApp, Facebook Messenger, Snapchat)', and 'reading news'. Higher scores reflect more frequent use of computer and mobile devices.

A **user experience survey** comprising 14 items was designed to assess participants' experiences of completing the SAI©. Participants rated the extent to which each of 14 adjectives described their experience using a 5-point Likert scale from 'strongly disagree' to 'strongly agree'. Examples of adjectives included 'easy', 'confusing', and 'time consuming'. Higher scores reflect a more positive user experience (some items were reverse coded). Participants were also asked whether they had completed the SAI© by hand, on the computer, or on a mobile device, and were asked to rate their perceived preference for completing the SAI© in each format.

2.3. Procedure

Participants completed Session 1 individually in the laboratory. They were informed that they would watch a filmed event and that they would later be asked some questions about it. Participants viewed the stimulus event on a PC monitor and were then allocated randomly to one of the three experimental conditions. Participants in the paper SAI© condition completed the standard SAI© booklet using a pen to write their responses. Participants allocated to the computer SAI© condition filled in an online version of the standard SAI© booklet via the computer. Participants in the mobile SAI© condition were provided with a wifi-password and a link to the online SAI© and completed it on their smart-phone or mobile device. As it was not possible for the sketch instruction to be completed online without specialist software, participants in the computer and mobile conditions were provided with the relevant page printed from the SAI© so that they could complete this section by hand. Thus, the full SAI© was completed in each condition, albeit not 100% online for the computer and mobile conditions. No time restrictions were enforced. On completion, all participants completed the user experience survey and the usage survey. Participants were then asked to confirm the format in which they had completed the SAI© and to indicate whether they had a strong preference for one of the possible SAI© reporting formats (handwritten, computer, mobile device). There was no difference between conditions with respect to reported frequency of use of computers ($F(2, 85) = 1.44$, $p = .24$, $\eta 2 = 0.03$) or mobile devices ($F(2, 85) = 1.82$, $p = .17$, $\eta 2 = 0.04$; (see Table 2 for descriptives). On completion of Session 1, participants provided their contact details and confirmed arrangements for Session 2 which was scheduled one week later.

Exactly seven days later, each participant was telephoned by a researcher as agreed (12 participants did not answer the call that day, of which four were interviewed the following day or the day after, and eight were withdrawn from the study). Participants were asked to provide a detailed free recall verbal account of what they could remember about the witnessed event. Two open prompts were used to elicit more information about a detail already mentioned (e.g., "You mentioned a boy with white trainers; tell me more about the boy"). All interviews ended with the final question "Is there anything else you would like to add?". Again, no time restrictions were imposed. On completion of their account, participants were thanked, debriefed, and compensated with an honorarium for taking part in the study. Session 2 phone interviews were audio-taped and transcribed.

2.4. Coding

The SAI© data provided in Session 1 and the Free Recall data provided in Session 2 were coded for quantity and accuracy. As in Gabbert et al. (2009), accounts were coded using a scoring template devised to reflect the details depicted in the stimulus event. A detail was deemed correct if it was present in the event and described correctly, and incorrect if it was present in the event but described incorrectly or if it was not present in the event at all. Each detail provided was scored. For example, the description detail 'jeans' received one mark, but the description details 'blue, ripped, jeans' received three marks. Each detail was counted only once when tallying the total score. Subjective (e.g., 'they were ugly') or ambiguous (e.g., 'he was old') responses were not coded.

To assess inter-rater reliability, 10 randomly selected interviews were independently coded by two coders. Correlations indicated that inter-rater reliability was acceptable for correct details from Session 1 (0.983) and Session 2 (0.997), and for incorrect details from Session 1 (0.924) and Session 2 (0.963).

3. Results

An alpha level of 0.05 was used for all statistical tests. For the number of correct details reported, the Levene's (1960) test for equality of variance was significant, thus for this variable we used a non-parametric statistic, the Kruskal-Wallis H test. There were no statistically significant differences between SAI© reporting conditions in Session 1 for the number of correct details reported, $H(2) = 0.02$, $p = .99$. For the remaining variables, the Levene's test was non-significant. Independent ANOVAs indicated there were no statistically significant differences between conditions for the number of incorrect details reported ($F(2, 85) = 0.15$, $p = .86$, $\eta p2 = 0.004$) or the accuracy rate, $F(2, 85) = 0.16$, $p = .85$, $\eta p2 = 0.004$ (see Table 1 for descriptives). Similarly, there were no statistically significant differences between reporting conditions for the information reported after a one-week delay in Session 2. Specifically, there were no statistically significant differences for the number of correct details reported ($F(2, 85) = 2.38$, $p = .10$, $\eta 2 = 0.05$), the number of incorrect details reported ($F(2, 85) = 1.26$, $p = .29$, $\eta p2 = 0.03$) or the accuracy rate for information in the delayed interview, $F(2, 85) = 0.17$, $p = .84$, $\eta 2 = 0.004$).

To inform our interpretation of the lack of significant differences between the SAI© conditions, we calculated Bayes Factors for each measure using JASP (Version 0.9.0.1). These Bayes Factors compared a main effects model (incorporating the main effect of SAI© format) to a null model. In Session 1, the null model was preferred; the Bayes Factors, for correct details, incorrect details and accuracy rates were $BF_{01} = 9.44$, $BF_{01=}8.74$ and $BF_{01=}8.70$ respectively, suggesting substantial evidence for H_0 over alternative hypotheses in all cases. In Session 2, the null

Table 1
Means and standard deviations for details reported in each condition in Experiment 1.

	Paper SAI© (n = 31)	Computer SAI© (n = 31)	Mobile SAI© (n = 26)
	Mean (SD)	Mean (SD)	Mean (SD)
Immediate SAI			
Correct	19.74 (5.28)	20.26 (9.60)	19.69 (6.77)
Incorrect	3.19 (2.18)	3.00 (2.37)	2.88 (1.84)
Accuracy rate	0.86 (0.08)	0.85 (0.09)	0.87 (0.08)
One-week delay			
Correct	20.90 (5.83)	18.00 (6.57)	21.23 (6.47)
Incorrect	2.90 (2.30)	2.13 (1.63)	2.73 (2.03)
Accuracy rate	0.88 (0.08)	0.89 (0.08)	0.88 (0.08)

model was also preferred; the Bayes Factors for correct details, incorrect details and accuracy rates were $BF_{01} = 1.51$, $BF_{01} = 3.61$, and $BF_{01} = 8.60$ respectively, suggesting anecdotal to strong evidence for the null model.

Next, to determine whether initial reporting format differentially affected either the quantity or accuracy of reporting in a delayed interview, we conducted a series of 2 (Time of Interview) x 3 (Format of SAI©) mixed ANOVAs on correct details, incorrect details, and accuracy rates. There was no statistically significant main effect of time of test on the amount of correct information reported ($F(1, 85) = 0.02$, $p = .90$, $\eta 2 = 0.00$), no statistically significant main effect for reporting condition ($F(2, 85) = 0.69$, $p = .50$, $\eta 2 = 0.02$) and the interaction was not statistically significant ($F(2, 85) = 1.33$, $p = .27$, $\eta 2 = 0.03$). Similarly, there was no statistically significant main effect of time of test on the amount of incorrect information reported ($F(1, 85) = 2.23$, $p = .14$, $\eta 2 = 0.03$), no statistically significant main effect for reporting condition ($F(2, 85) = 0.74$, $p = .48$, $\eta 2 = 0.02$) and, again, the interaction was not statistically significant ($F(2, 85) = 0.57$, $p = .57$, $\eta 2 = 0.01$). Interestingly, for accuracy rate, there was a statistically significant main effect of time of test, with higher accuracy rates recorded across conditions in the delayed interview, $F(1, 85) = 4.95$, $p = .03$, $\eta 2 = 0.06$. The main effect for reporting condition was not statistically significant, $F(1, 85) = 0.05$, $p = .95$, $\eta 2 = 0.001$, and neither was the interaction $F(2, 85) = 0.32$, $p = .73$, $\eta 2 = 0.007$.

Given the possibility that perceived preference for a particular reporting format might affect performance, we re-ran the same analyses including format preference as a covariate to factor in whether the participant had used a preferred format (match) as opposed to a less preferred format (mis-match) to provide their initial account. Taking preference into account did not change the overall pattern of findings across any outcome measure. Similarly, including self-reported frequency of use of computers and mobile devices as a covariate did not affect the results for any outcome measure. Descriptive statistics for each of these covariates are shown in Table 2. Full details of these additional analyses are reported in the Supplementary Materials folder [see https://osf.io/h7rqd/?view_only=e790ffa8373e401bb81cc3a96e1b19fe].

Finally, the average SAI© user experience rating did not significantly differ between condition (Paper $M = 3.35$, $SD = 0.61$; Computer $M = 3.57$, $SD = 0.42$; Mobile device $M = 3.57$, $SD = 0.44$), $H(2) = 4.03$, $p = .13$. Bonferroni pairwise comparisons showed no significant difference between conditions in user experience ratings ($ps > 0.10$).

4. Discussion

There were no meaningful differences in the quantity or quality of information provided by mock witnesses irrespective of whether they provided their accounts via a computer, a mobile device, or by hand. Taking account of stated preference for reporting format, or amount of time spent using either computers or mobile devices, had no significant impact on these results. Furthermore, user experience ratings of the SAI© did not significantly differ between format conditions. These results suggest that the SAI© can be used across a number of formats with no detrimental effects relating to the information reported or user-experience. Importantly, response format did not significantly affect either the quantity or accuracy of reporting in a delayed interview.

However, in Experiment 1 we did not include a non-SAI© reporting format control group against which we could compare the performance of the SAI© groups. Although the efficacy of the pen-and-paper SAI© versus relevant control conditions is well-established (e.g., Gabbert et al., 2009; Gittens, Paterson, & Sharpe, 2015; Horry et al., 2021), it is important to assess the efficacy of the digital SAI© against a control group. In Experiment 2, we included a free recall group, who were simply instructed to write down (in a pen and paper format) the most complete and accurate account of the event that they could. This free recall condition was compared with a pen-and-paper SAI© and a mobile SAI© condition, who completed the SAI© on an iPad. We did not include a computer SAI© condition, as we reasoned that mobile devices would be used in the field by witnesses more frequently than computers. To increase generalizability, we used a different mock crime event in Experiment 2. Finally, we changed the format of the Time 2 account from a verbal interview to a pen-and-paper free recall test.

Drawing upon prior SAI© research, we predicted that participants in the two SAI© groups would produce more correct information than participants in the free recall condition. Informed by the findings of Experiment 1, we predicted that the two SAI© groups would be similar in performance. Last, we predicted that accuracy rates would be similar for all three conditions.

Table 2
Descriptive statistics for the usage of mobile and computer devices, and user experience surveys in Experiment 1.

Measure	Paper SAI© Mean (SD)	Computer SAI© Mean (SD)	Mobile SAI© Mean (SD)
Usage of computer devices	42.77 (16.89)	49.11 (12.81)	44.95 (14.75)
Usage of mobile devices	56.94 (12.98)	55.19 (15.48)	61.50 (7.87)
SAI© user experience survey	46.87 (8.56)	50.04 (6.20)	50.00 (5.84)
SAI© modality preference	2.55 (1.06)	2.84 (1.00)	2.65 (1.02)

Note: Higher scores on the SAI© modality preference variable indicate a stronger preference for the modality in which the SAI© was completed.

Experiment 2

5. Method

5.1. Participants and design

A 3 (Initial account format: Paper SAI©, mobile SAI©, free recall) x 2 (Time of recall: Immediate, one-week delay) mixed design was used, with initial account format as the between-subjects factor and time of recall as the within-subjects factor. The Ethics Committee at [redacted] University granted ethical approval for the research. A total of 75 participants took part. All participants signed informed-consent forms prior to participation. Community-based participants were recruited via posters, emails, and social media. All participants (42 female; 33 male) were fluent in English, with an average age of 27.35 years (SD = 12.92; range = 18–79 years). Participants were allocated randomly to the paper SAI© condition (n = 26), the mobile SAI© condition (n = 25), or the free recall condition (n = 24). Eight participants did not return for Session 2, and so were excluded from the analyses; two from the paper SAI© condition, three from the mobile SAI© condition and three from the free recall condition (thus, final cell sizes were 24, 22, and 21 for paper, computer, and mobile conditions respectively). The dependent measures were the number of correct and incorrect details and the accuracy rate of information reported.

5.2. Materials

5.2.1. Stimulus event. The stimulus event was a short video (2 min 30 s) depicting a non-violent attempted theft in a car park. Three people attempted to break into a car before being chased away by the owners of the car. The film also includes several passers-by.

5.2.2. Recall formats. The paper SAI© and mobile SAI© were identical to those used in Experiment 1. The free recall sheet was a double-sided sheet of A4 paper with the following instructions at the top: *"Please use the space below (and overleaf) to report what you can remember about the event. Try to include information about what happened as well as describing the actors involved in the event (including other witnesses and passers-by). Please try to provide the most complete and accurate account that you can. Avoid guessing about any details that you are unsure of. If you require any additional sheets of paper, please ask the researcher"*.

5.2.3. Additional measures. All participants completed the usage of mobile devices survey. Participants in the SAI© conditions also completed the user experience survey. These surveys were identical to those used in Experiment 1. In addition, participants in Experiment 2 completed an 'attitudes towards mobile devices' survey comprised of 11 items designed to assess how positively participants feel about their engagement with mobile devices. For each item, participants rated their agreement on a 7-point Likert scale from 'strongly disagree' to 'strongly agree'. Example statements included 'Mobile devices help me learn', 'Mobile devices save me time' and 'I can make mobile devices do what I want them to do'. Higher scores reflect more positive attitude towards mobile devices. Measures are available in the Supplementary Materials folder (https://osf.io/h7rqd/?view_only=e790ffa8373e401bb81cc3a96e1b19fe).

5.3. Procedure

Participants completed Session 1 individually in the laboratory. Participants were informed that they would watch a filmed event and that they would later be asked some questions about that event. The participants watched the crime event on a PC monitor. They then completed the usage of mobile devices and attitudes to mobile devices surveys. Participants were allocated randomly to the paper SAI©, mobile SAI©, or free recall condition. Participants in the paper SAI© condition were provided with a paper version of the SAI© and a pen and were then left alone to work through the booklet at their own pace. Participants in the mobile SAI© condition were provided with an iPad. The experimenter checked that the participant was comfortable using the iPad and answered any questions about using the device that arose. The participants were then left alone to complete the SAI©. As in Experiment 1, participants were directed to complete the sketch component of the SAI© on a piece of paper that was provided on the participant's desk. Participants in the free recall condition were provided with a free recall sheet and a pen and were left to complete their account alone. Following the completion of their initial account, participants in the two SAI© conditions completed the user experience survey. At the end of Session 1, participants confirmed a time and date for Session 2 which was scheduled one week later.

In Session 2, all participants were instructed to think back to the witnessed event. They were provided with a free recall form and a pen and were instructed to write down their memory of the event. No time restrictions were placed upon participants. At the end of the session, participants were compensated with an honorarium for taking part in the study.

5.4. Coding

All SAI© and free recall data from Sessions 1 and 2 were coded for quantity and accuracy using a scoring template. Details were included only once when calculating total scores, and subjective, unverifiable, and ambiguous responses were not scored. To ensure inter-rater reliability, 10 Session 2 interviews were randomly selected and independently coded by two coders. Inter-rater reliability was acceptable for correct details ($r = 0.998$) and incorrect details ($r = 0.995$).

6. Results

As in Experiment 1, an alpha level of 0.05 was used for all statistical tests. Where appropriate, Levene's (1960) test for equality of variance was assessed. Where appropriate, non-parametric tests are used. Descriptive statistics are shown in Table 3.

The number of correct details reported in Session 1 was compared across conditions using a between-subjects one-way ANOVA. The main effect of report format was statistically significant, $F(2, 64) = 20.24$, $p < .001$, $\eta p2 = 0.39$. Tukey HSD tests showed that participants in the paper SAI© condition reported more correct details than participants in the free recall condition; mean difference = 64.44, 95% CI [42.98, 85.59], $p < .001$. Participants in the mobile SAI© condition also reported more correct details than participants in the free recall condition; mean difference = 51.95, 95% CI [30.94, 72.97], $p < .001$. The number of correct details reported was not significantly different between the paper and mobile SAI© conditions, mean difference = 12.48, 95% CI [−8.27, 33.24], $p = .23$.

Table 3
Means and standard deviations for details reported in each condition in Experiment 2.

	Paper SAI© (n = 24)	Mobile SAI© (n = 22)	Free recall (n = 21)
	Mean (SD)	Mean (SD)	Mean (SD)
Immediate SAI			
Correct	135.82 (40.97)	123.33 (28.70)	71.38 (35.43)
Incorrect	12.14 (5.56)	10.04 (5.69)	6.33 (4.35)
Accuracy rate	0.92 (0.04)	0.93 (0.03)	0.92 (0.04)
One-week delay			
Correct	96.55 (31.33)	100.38 (27.98)	62.81 (33.57)
Incorrect	7.32 (3.15)	8.25 (4.95)	5.43 (3.17)
Accuracy rate	0.93 (0.03)	0.92 (0.04)	0.92 (0.04)

The number of incorrect details reported in Session 1 also significantly differed across conditions, $F(2, 64) = 6.69$, $p = .002$, $\eta p2 = 0.17$. Tukey HSD tests showed that participants in the paper SAI© condition reported more incorrect details than participants in the free recall condition; mean difference = 5.80, 95% CI [2.60, 9.01], $p = .001$. Participants in the mobile SAI© condition also reported more incorrect details than participants in the free recall condition; mean difference = 3.71, 95% CI [0.57, 6.85], $p < .001$. The number of incorrect details reported was not significantly different between the paper and mobile SAI© conditions, mean difference = 2.09, 95% CI [−1.01, 5.20], $p = .18$. Accuracy rates in Session 1 were high, with no significant differences between conditions, $F(2, 64) = 0.45$, $p = .64$, $\eta p2 = 0.014$.

Session 1 reporting format had a statistically significant impact on the number of correct details reported in Session 2, $F(2, 64) = 9.72$, $p < .001$, $\eta p2 = 0.23$. Tukey HSD tests showed that participants in the paper SAI© condition reported more correct details than participants in the free recall condition; mean difference = 33.74, 95% CI [14.89, 52.58], $p = .001$. Participants in the mobile SAI© condition also reported more correct details than participants in the free recall condition; mean difference = 37.57, 95% CI [19.11, 56.02], $p < .001$. The number of correct details reported was not significantly different between the paper and mobile SAI© conditions, mean difference = −3.83, 95% CI [−22.06, 14.40], $p = .68$.

The effect of (Session 1) reporting format on the number of incorrect details reported in Session 2 was not statistically significant, $F(2, 64) = 3.00$, $p = .057$, $\eta p2 = 0.086$. However, because the p value was close to the alpha level, we conducted pairwise Tukey HSD tests. These tests revealed that participants in the mobile SAI© condition reported more incorrect details than participants in the free recall condition; mean difference = 2.82, 95% CI [0.49, 5.15], $p = .018$. Participants in the paper SAI© condition did not report significantly more incorrect details than participants in the free recall condition; mean difference = 1.89, 95% CI [−0.49, 4.27], $p = .12$. The number of incorrect details reported was not significantly different between the paper and mobile SAI© conditions, mean difference = −0.93, 95% CI [−3.23, 1.37], $p = .42$. Accuracy rate in Session 2 was high, and there were no significant differences between conditions, $F(2, 64) = 0.15$, $p = .86$, $\eta p2 = 0.005$.

As in Experiment 1, to inform our interpretation of the lack of significant differences between the SAI© conditions, we conducted Bayesian *t*-tests using JASP 0.9.0.1, comparing the paper and mobile SAI© conditions. In Session 1, the Bayes Factors for correct details, incorrect details and accuracy rate were $BF_{01} = 1.90$, $BF_{01=}1.80$ and $BF_{01=}2.23$, respectively. In Session 2, the Bayes Factors for correct details, incorrect details and accuracy rate were $BF_{01} = 3.16$, $BF_{01} = 2.72$,

and $BF_{01} = 3.27$ respectively. Thus, in all cases the BFs were weakly to moderately supportive of the null hypothesis, though the evidence was generally stronger for the Session 2 measures than for the Session 1 measures.

Next, we conducted a series of 2 (Time of Interview) x 3 (Session 1 Report Format) mixed ANOVAs on correct details, incorrect details, and accuracy rates. For correct details, the interaction term was statistically significant, $F(2, 64) = 6.18$, $p = .004$, $\eta p2 = 0.16$. Post-hoc repeated t tests revealed that the number of correct details significantly decreased from Session 1 to Session 2 for the paper SAI©, $t(21) = 7.09$, $p < .001$, $d = 1.47$, 95% CI [0.86, 2.06], and for the mobile SAI©, $t(23) = 3.08$, $p = .005$, $d = 0.61$, 95% CI [0.17, 1.04]. For the free recall condition, the decrease in correct details from Session 1 to Session 2 was smaller and not statistically significant, $t(20) = 2.01$, $p = .058$, $d = 0.42$, 95% [−0.02, 0.87]. Unsurprisingly, the main effects of time, $F(2, 64) = 45.31$, $p < .001$, $\eta p2 = 0.41$, and reporting format, $F(2, 64) = 17.84$, $p < .004$, $\eta p2 = 0.36$, were statistically significant.

For incorrect details, the interaction term was also statistically significant, $F(2, 64) = 4.21$, $p = .019$, $\eta p2 = 0.12$. Post-hoc repeated t tests revealed that the number of incorrect details significantly decreased from Session 1 to Session 2 for the paper SAI©, $t(21) = 4.82$, $p < .001$, $d = 1.00$, 95% CI [0.49, 1.51], but that the decrease was not statistically significant for the mobile SAI©, $t(23) = 1.56$, $p = .13$, $d = 0.31$, 95% CI [−0.10, 0.72], or for the free recall condition, $t(20) = 1.26$, $p = .22$, $d = 0.26$, 95% CI [−0.17, 0.70]. The main effects of time on incorrect details was statistically significant, $F(2, 64) = 19.20$, $p < .001$, $\eta p2 = 0.23$, as was the main effect of reporting format, $F(2, 64) = 5.78$, $p = .005$, $\eta p2 = 0.15$.

For accuracy rate, the interaction term was not statistically significant, $F(2, 64) = 1.27$, $p = .29$, $\eta p2 = 0.04$. Neither the main effect of time, $F(2, 64) = 0.92$, $p = .34$, $\eta p2 = 0.014$, nor the main effect of reporting format, $F(2, 64) = 0.10$, $p = .91$, $\eta p2 = 0.003$, were statistically significant.

Performance on the mobile SAI© may be affected by attitudes toward, and frequency of usage of mobile devices. To explore this possibility, we conducted a series of 2 (Time) x 2 (SAI© type: paper, mobile) mixed ANCOVAs (one for each dependent variable). Total scores on the attitudes to mobile devices scale, total scores on the usage of mobile devices scale, and preference for reporting format were included as covariates. Preference was coded such that a higher value indicated a stronger preference for the format in which the SAI© had actually been completed. We did not include the free recall group in these analyses, as they did not complete the preference measure. Descriptive statistics for each of these covariates are shown in Table 4. Factoring in these covariates did not change any of the conclusions about the (lack of) differences between the mobile and paper SAI© formats. Full details of the analyses are available in the Supplementary Materials [see https://osf.io/h7rqd/?view_only=e790ffa8373e401bb81cc3a96e1b19fe].

Finally, we tested whether user experience scores differed between the paper ($M = 46.45$, $SD = 6.43$) and mobile ($M = 45.75$, $SD = 5.46$) SAI© conditions. An independent t-test revealed that these means were not significantly different, $t(44) = 0.40$, $p = .69$, $d = 0.12$, 95% CI [−0.48, 0.71].

Table 4
Descriptive statistics for the attitudes to mobile data, usage of mobile devices, and user experience surveys in Experiment 2.

Measure	Paper SAI© Mean (SD)	Mobile SAI© Mean (SD)	Free recall Mean (SD)
Attitudes to mobile devices	61.05 (9.43)	59.21 (8.92)	54.33 (14.42)
Usage of mobile devices	62.68 (8.30)	62.63 (9.81)	57.48 (15.21)
SAI© user experience survey	46.45 (6.43)	45.75 (5.46)	—
SAI© modality preference	4.00 (1.16)	3.00 (1.18)	—

Note: Higher scores on the SAI© modality preference variable indicate a stronger preference for the modality in which the SAI© was completed.

7. Discussion

Experiment 2 replicated and extended the findings of Experiment 1. Specifically, SAI© format had negligible effects on the number of correct and incorrect details reported. In line with prior research, the paper SAI© condition resulted in many more correct details than the free recall control condition, with no cost to overall accuracy rates. Experiment 2 also demonstrated that the mobile SAI© produced an advantage over the free recall condition, that was similar in magnitude to the paper SAI©. The SAI© benefit was maintained after a one-week delay for both modalities. Importantly, on all outcome measures, no meaningful differences between the two SAI© conditions were observed.

The SAI© conditions showed a larger decrease in information quantity over the one-week delay than the free recall condition. This may be partly attributable to the fact that the initial accounts of the SAI© participants included many more details than the initial accounts of the free recall participants, leaving more scope for details to be forgotten after the delay. Additionally, the SAI© participants experienced a change in report type, from an SAI© to a free recall form, whereas for free recall participants the two reports formats were identical. However, importantly, one week following the target event, participants who had initially provided an account using an SAI© still reported considerably more details than participants who had initially provided a free recall account.

8. General discussion

Across two experiments, we examined the efficacy of the SAI© when administered digitally – either via a mobile device or via a computer. Witness performance, in terms of quantity and accuracy of details reported, was similar across all SAI© formats. In Experiment 2, we compared the pen-and-paper SAI© and the mobile SAI© against an open-ended pen-and-paper free recall form. Both SAI© conditions outperformed the free recall group in the number of correct details reported, while maintaining similar accuracy rates. In both experiments, participants returned after one week to complete a second recall test (a verbal interview in Experiment 1 and a written free recall form in Experiment 2). In line with memory theory, there was a possibility that the quality of information reported initially, based on the nature of the initial report format, would influence subsequent reporting. The Experiment 2 results indicate that both SAI© groups reported considerably more details than control participants who had initially provided a free recall account; this pattern was true for the initial account (Session 1) and for the subsequent account (Session 2). Further, in both experiments, the format of the initial SAI© had no effect on either the quantity or quality of information reported immediately nor in an interview conducted after a one-week delay. Bayes Factors indicated that the data favored the null hypothesis, allowing us to rule out the possibility that the data were inconclusive, and/or that we lacked statistical power to find small but potentially meaningful effects.

The current research is a first step in investigating the potential efficacy of a digital SAI©. Our findings are of practical relevance given that modes of communication are changing, and people increasingly communicate with other people via digital means (e.g. SMS, IM, email; Anderson & Perrin, 2017; Ofcom, 2018a). Furthermore, digital formats offer several advantages over paper-formats in relation to lower cost, lower carbon-footprint, and increased speed of delivery/return. Digital modalities also offer considerably more flexibility than paper forms, including accessibility and language options. Functionality could be built in to allow witnesses to audio- or video-record their reports, and to upload photographs and video of the scene.

A limitation of the current research is that we could not objectively monitor participants' typical computer and mobile device usage or any associated fluency in the use of different hardware. However, self-reported preferences and usage did not appear to impact on our findings. This null result may reflect a demographic feature of the sample.

Specifically, while participants in this research ranged in age from 18 to 77 years, the average age was just over 31 years in Experiment 1 and 27 years in Experiment 2. Younger-middle aged samples may prefer to complete their accounts in digital formats given the prevalence of use of computers and mobile devices in that age group; statistics show that 97% of 25–34 year olds use a smart phone in the UK (Consumer Barometer with Google, 2017a; 2017b). However, trends indicate increased use of digital media among older age groups too (Ofcom, 2018b). The current findings suggest that witnesses might be invited to complete the SAI© using the reporting format they prefer without any negative consequences for the account provided. This flexibility is beneficial for investigators if witnesses are uncomfortable with providing their account digitally (e.g. due to lack of familiarity with typing or technology) or alternatively, do not wish to write their account longhand (e.g. due to poor handwriting skills).

In common with practically all research on witness memory, we were unable to evaluate the effect of witness motivation to provide an account. Although witnesses might be willing to provide accounts at the scene of an incident or shortly afterwards when in possession of an official form provided by the police, it is not clear whether witnesses will be similarly motivated to click on a link to provide an account of an incident. Relatedly, another real-world factor may be the extent to which witnesses using computers or mobile devices may be distracted across multiple tasks while providing their account. Distractions, such as pop-up notifications and other incoming messages, are particularly prevalent on mobile devices and it is possible that may impede retrieval processes (although distractions at encoding are consistently found to be more detrimental to performance than distractions at retrieval, Craik et al., 2018; Craik et al., 1996). In this context, witnesses may need additional instructions or perhaps technological solutions may be feasible through the use of app-based software that can mute or pause notifications until the account has been completed.

In conclusion, the current findings provide preliminary empirical data supporting the use of the SAI© in digital formats and confirm that the typical SAI© effect (Gabbert et al., 2009; Hope et al., 2014; Horry et al., 2021) is maintained both in the initial accounts and in a delayed recall. However, we encourage researchers to examine the effectiveness of digital reporting modalities in situations that more closely approximate the experience of a real witness, including the potentially disruptive influence of chat notifications and other push notifications. We also encourage researchers to explore the potential benefits of some of the increased functionality that is made possible by digital reporting, including the ability for witnesses to submit photos, videos, and audio recorded reports.

Data availability statement

Materials, Datasets, and Supplementary Analyses are available on the OSF project page: https://osf.io/h7rqd/?view_only=e790ffa8373e401bb81cc3a96e1b19fe.

Declaration of competing interest

The authors have no conflict of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chbr.2021.100159.

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