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Mental time travel ability and the mental reinstatement of context for crime witnesses

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Abstract

Mental time travel ability marks how well the phenomenological aspects of events are mentally re-experienced during recall. The Cognitive Interview (CI) elicits eyewitness information. One of its techniques, Mental Reinstatement of Context (MRC), asks eyewitnesses to reinstate the incident's context mentally before recall. Fifty-six participants watched a simulated crime video. Self-report measures were then taken to estimate general mental time travel ability. Participants were questioned subsequently about the video. Eyewitness performance under MRC was compared with the CI's Report Everything (RE) technique, wherein eyewitnesses recall everything they can but with no invitation to mentally reinstate the context. There was no effect of interview condition on accuracy of recall; however, general mental time travel ability was positively associated with the amount of correct and incorrect information produced under MRC, but not RE, conditions. This is the first empirical demonstration that MRC instructions engage the mental time travel capacities they purport to.

Keywords: Eyewitness memory; Cognitive Interview; Mental time travel

Mental time travel ability and the mental reinstatement of context for crime witnesses

1. Introduction

The evidence gained from the verbal reports of people witnessing a crime plays a central role in the investigative process (e.g., Gabbert, Hope & Fisher, 2009; Kebbell & Milne, 1998). It is, therefore, very important to crime investigators to elicit as much, and as accurate, information from eyewitnesses in as timely a manner as possible. One interviewing technique designed to facilitate the elicitation of crime event information from eyewitnesses is the Cognitive Interview (CI; Geiselman et al., 1984; Geiselman, Fisher, MacKinnon & Holland, 1986). The CI contains a number of different components, each of which places its emphasis on a different method of obtaining information from the interviewee; amongst these is a component whose instructions ask eyewitnesses to mentally place themselves back in the context of the crime event before stating all the details that they can remember about that event. This mnemonic technique is known as Mental Reinstatement of Context (MRC). Mental time travel (e.g., Suddendorf & Corballis, 1997; Suddendorf, Addis & Corballis, 2009), describes the ability to travel mentally backwards and forwards in time when considering the what, where, and when of a personal event (or www-memory; e.g., Roberts & Feeney, 2009) and is closely linked to episodic memory (e.g., Tulving, 1985, 2001). The ability to travel mentally in time has been found to vary between individuals (e.g., D'Argembeau & van der Linden, 2006) and over the life-span (e.g., Clayton & Russell, 2009; Souchay, Isingrini & Espagnet, 2000; Tulving, 2002). In asking the eyewitness to place themselves mentally back in the context of a crime event, the MRC process would, prima facie, appear to engage the same //(or very similar) processes as those involved in mental time travel. However, as far as the authors are aware, this assumption has not previously been subject

to empirical investigation. The current study, therefore, sought to determine whether individual differences in generalized mental time travel ability would influence eyewitness memory and, in particular, whether these differences would influence the effectiveness of the MRC interviewing technique in eliciting information about a simulated crime event.

Mental time travel encompasses both the ability to re-experience personal events from the past (i.e., episodic memory) and to "pre-experience" (e.g., Szpunar, 2010) imagined events in a personal future (i.e., episodic future thinking; e.g., Atance & O'Neill, 2001; Szpunar, 2010). When engaged in mental time travel, a person re-experiences mentally the feelings, sensations, and environmental setting of the event in question. The various phenomenological aspects of mental time travel, tapping into the various sensations, bodily experiences, and physicality of personally experienced events can be probed experimentally using a combination of cued-writing and self-report responses. The Crovitz-Schiffman technique (Crovitz & Schiffman, 1974), used in conjunction with the Memory Characteristics Questionnaire (MCQ; Johnson, Foley, Suengas & Raye, 1988), is argued to allow an insight into the phenomenological experiences associated with recalling a specific episode from an individual's personal past (e.g., Arnold, McDermott & Szpunar, 2011a,b; D'Argembeau & Van der Linden, 2006). Under this paradigm, individuals are presented with a memory cue in the form of a single word. They are then asked to write about a memory, usually (but not necessarily) triggered in response to that cue, for a short period of time. At the end of this writing phase, the individuals are presented with the 12-item MCQ and asked to rate the extent to which they mentally re-experienced the event along a number of different phenomenological dimensions. Individual differences in MCQ scores have been found in response to cues about personally experienced events from the past and imagined personal events in the future (e.g., Arnold et al., 2011a), indicating that this approach does allow an insight into

mental time travel and differentiates between individuals in terms of the extent to which an event is subjectively re- (or pre-) experienced.

As mentioned previously, the CI is a memory enhancing interview protocol developed by Geiselman et al. 1984 (see also Geiselman et al., 1986). It was developed in response to a direct request from police officers who raised a concern that, when probed, eyewitnesses rarely remember as much information as police officers would like (Kebbell & Milne, 1998). To meet the aim of improving eyewitness accounts, the CI consists of four memory enhancing components 1) Report Everything (RE), 2) MRC, 3) Change Temporal Order, and 4) Change Perspective. These four components are underpinned at a theoretical level by Bower's (1967) Multiple Trace Theory. Bower suggested that because memory is reconstructive and consists of multiple associations, it may be possible to access a particular memory in a number of different ways. Thus, with specific reference to the CI, if a witness' memory cannot be accessed using one technique, then it may be possible to access it using a different technique. The CI as originally proposed by Geiselman et al. was further developed by Fisher and Geiselman (1992) to embed the original four memory enhancing components, along with new strategies and techniques focusing on the psychology of interpersonal communication, within a clear, phased interview structure. Within this structure, each phase of the interview contributed towards the overall success of the interview. This 'enhanced' CI (or ECI) is now used by many police forces around the world to interview co-operative victims and eyewitnesses. Research has demonstrated that the (E)CI leads to a large and statistically significant increase in correct recall compared with a control interview which does not contain the four memory-enhancing components of the CI (Memon, Meissner & Fraser, 2010). A more in-depth examination of the two memory enhancing (E)CI components used in the present study, namely MRC and RE, now follows.

Mental Reinstatement of Context is widely perceived as one of the most effective components of the CI (Dando, Wilcock & Milne, 2008). It is based on the Encoding Specificity Hypothesis (Tulving & Thompson, 1973) which posits that reinstating the original encoding context at the point of retrieval is likely to lead to increased recall. Consistent with this hypothesis, Godden and Baddeley (1975) demonstrated that the recall of word lists by divers was approximately 50% higher if they both learnt the words and retrieved the words underwater (i.e., in the same context or physical environment), than when learning took place underwater and retrieval occurred on land (i.e., different physical contexts). In addition to physical context, personal context has also been found to be important. Bower (1981) induced either happy or sad moods in participants using hypnosis prior to asking them to learn lists of words. Recall was significantly better if the participants' mood states at learning and recall matched than if their moods differed between learning and recall.

Of course, when a criminal act is being investigated, it may not be appropriate for a witness to return to the physical location of the crime. When such a case arises, interviewees are instead asked to mentally reconstruct the context of the crime, in terms which are both physical (i.e., environmental) and personal (e.g., how the interviewee felt at the time). This process of mental reconstruction is argued to increase the feature overlap between retrieval and the encoded event (Wilcock, Bull & Vrij, 2007). To facilitate this process of mental reconstruction, a series of short questions and statements are presented to the witness, such as "Think of where you were", "How were you feeling at the time", and "Think of all of the people who were present". Between each of these prompts, a pause is placed to allow the witness to develop the "image" of the event in their mind, thus reinstating the context of the crime event. Although Smith and Vela's (2001) meta-analysis suggest a beneficial effect of mental context reinstatement, it must be borne in

mind that some research shows no beneficial effect of context reinstatement under certain circumstances (e.g., Cutler, Penrod & Martens, 1987).

The RE component of the CI encourages eyewitnesses to report everything they can remember about the event in question, going beyond their self-generated attempts to do so. To this end, they are instructed to report all the details that they can remember about the event in question and to do this without any editing on their part, even if the information seems trivial and/or they can only partially remember a particular aspect. Whilst a piece of information may seem unimportant to the interviewee, it may form a vital lead if actually reported. Thus, the "Report Everything" instruction, with its emphasis on the reporting of every single detail, is argued to lower an individual's response criterion for reporting information (Milne & Bull, 2002) and reduce the omission of potentially crucial evidence. A further possible beneficial effect of the RE component is that the recollection of partial or trivial information may lead to the recollection of further information, with partially recalled details acting as retrieval cues for other aspects of the event (Milne & Bull, 2002).

To the best knowledge of the authors, the assumption that MRC instructions actually lead to people mentally re-experiencing the event in question has yet to be tested empirically. Further, given individual differences in mental time travel ability (e.g., D'Argembeau & van der Linden, 2006), it is important to explore this potentially limiting factor in the MRC's utility as an interviewing tool. The current study thus sought to determine whether individual differences in mental time travel would predict the quality of eyewitness memory of a simulated crime event differently under MRC conditions than under the CI's RE condition. Phenomenological experience is not emphasized when the RE technique is used by interviewers and, although there is a possibility that participants could spontaneously use "phenomenological experience" when

reporting everything, this was considered unlikely to occur in comparison with the recall of information when using MRC. As a consequence, it was thought that RE would prove a useful and appropriate control by which to see whether mental time travel was actually engaged under MRC conditions and, to a degree, indicate whether different aspects of cognition were called upon by the different CI components.

2 Method

2.1 Participants

Fifty-six adults took part in the study (35 females, 21 males, members of the general public and university students, aged 18-62 years, mean = 29 years, *SD* = 12). The participants were divided equally between two conditions which differed in the nature of the instructions presented to them when asked to recall a simulated crime event. The 28 participants (16 females, 12 males) in the "Recall Everything" (RE) condition had a mean age of 26 years (*SD* = 8). The remaining 28 participants (19 females, 9 males) in the Mental Context Reinstatement (MRC) condition had a mean age of 31 years (*SD* = 14). One participant in the MRC condition omitted to report her age. An unrelated *t*-test indicated that there was no significant difference in age between the two conditions, $t(41.714) = 1.52$, $p = .137$. There was also no significant association between gender and instruction condition, $\chi(1) < 1$, $p = .408$.

Two well-established tests were administered in order to ensure that participants in the two conditions were well-matched in other aspects of cognition which might contribute to performance. These tests also served as interpolated tasks between viewing the simulated crime event and having the opportunity to report information about it.

Firstly, to gain an approximate measure of the ability of the participants to retrieve verbal information from declarative memory, the Information subtest from the Wechsler Adult

Intelligence Scale – Fourth UK Edition (WAIS-IV; Wechsler, 2010) was administered. Due to time and resource constraints, the administration procedure was adapted slightly to allow it to be applied to multiple people at once but, otherwise, was presented in the standardized fashion. Usually, testing is terminated after three successive incorrect responses, but the adaptation meant that there was no opportunity to terminate testing once the questions had exceeded the ability of an individual participant to respond correctly to them. The twenty-four items of the Information subtest were therefore administered to all participants. Raw scores and standardized scores were calculated on the basis of the point at which the cut-off would have been applied had testing been performed on an individual basis. Participants in the RE (mean = 10.36, *SD* = 5.27) and MRC conditions (mean = 11.32, *SD* = 6.06) did not differ significantly in scaled score on the WAIS-IV Information subtest, $t(54) < 1$, $p = .528$,

The second measure used to match participant groups was the Rey-Osterrieth Complex Figure test (e.g., Bennett-Levy, 1984). This test was used to assess participants' visual perception and long-term visual memory. It consisted of a complex two-dimensional line drawing administered in three phases; a copy phase, an immediate recall phase (administered between a minute and a half and three minutes after the image was removed) and a delayed recall phase (administered approximately 40-50 minutes after the image was removed). There was no significant difference in Rey-Osterrieth Complex Figure score between the RE (mean = 26.98, *SD* = 3.81) and MRC (mean = 25.59, *SD* = 5.13) conditions, $t(54) = 1.15$, $p = .256$.

Due to resource limitations and time constraints, most of the data were collected on a group basis and group size generally ranged in number from two to four participants. However, the experiment was administered once to a group of 10 participants and some further participants were tested individually.

2.2 Materials

The task instructions were presented as slides on an overhead projector with the researcher reading them out loud to the participants.

The simulated crime event constituted a 30 second video of a bag snatching. The video consisted of two young adult females walking down an urban road and going past a building where a young adult male was sitting on a wall, watching them walk past. A moment later, the male ran up behind one of the females, snatched her bag, and ran off. The female chased the thief. However, he was quite some distance ahead of her and was able to pause to look in the bag and remove cash and some bank cards. He then gave the bag to an innocent bystander and ran off. The female victim then caught up with the innocent bystander and looked in the bag to discover her money and bank cards were missing. At this point, the film ends.

A modified version of the MCQ (Johnson et al., 1988), adapted by Arnold et al. (2011a,b), was used to assess general mental time travel ability. The participants answered 12 questions, rating the phenomenological experience related to different aspects of the memory on a one to seven scale. The individual questions probed the extent to which a participant felt that they experienced a feeling of mentally traveling back in time (1 = not at all, 7 = completely), how much of the sound of the event was recalled (1 = a little, 7 = a lot), the effort required to bring the event to mind (1 = a little, 7 = a lot), the feeling of re-experiencing the event (1 = not at all, 7 = completely), the clarity of the location (1 = vague, 7 = clear), the extent to which bodily movements were remembered (1 = not at all, 7 = completely), the clarity of the spatial arrangement of objects (1 = vague, 7 = clear), the clarity of the spatial arrangement of people (1 = vague, 7 = clear), if any smells or tastes were recalled (1 = a little, 7 = a lot), the degree to which the memory was recalled as a coherent story (1 = not at all, 7 = completely), the clarity of

time of day (1 = vague, 7 = clear) and the extent to which visual details were recalled (1 = a little, 7 = a lot). Following the collection of pilot data, an N/A option was added to the questionnaire for memories which were recalled without that particular characteristic featuring in the participant's recall of that memory, since circling the score of one would suggest the participant did not feel the characteristic greatly rather than it not being present at all.

Two cue words, the nouns "garden" and "kitchen", were selected from the Bird, Franklin, and Howard (2001) database of words, and were matched for Celex Word Frequency (Baayen, Piepenbrock & van Rijn, 1993), number of syllables, and Bird et al. age of acquisition and imageability ratings. The two cue words were utilized for each of the three timeframes (one day, one week, and one month ago), giving two trials per timeframe. The order of presentation of the timeframes and the cue words within each timeframe was counterbalanced within and across participants.

2.3 Design

Separate multiple linear regression analyses were performed on the different dependent variables (amount of information correctly recalled, amount of information incorrectly recalled, and number of confabulations). A mean MCQ rating was calculated for the different timeframes probed by the cue words in order to give a measure of each participant's general mental time travel abilities. This mean value was entered as a predictor variable into each regression model, together with WAIS-IV Information score and Rey-Osterrieth Complex Figure score.

2.4 Procedure

Informed consent was obtained from the participants prior to testing. All testing was carried out by one of the authors (JB). The order in which the different phases of the experiment were presented is displayed in Figure 1. After agreeing to take part, the participants were shown

the Rey-Osterrieth Complex Figure test image, and given as much time as they needed to copy it out onto the paper provided. Once the test image was removed from view, the participants were shown the 30s simulated crime event video of the bag snatching. At the end of the video, the participants completed the immediate Rey-Osterrieth Complex Figure recall phase in which they drew the complex image as best they could from memory.

FIGURE 1 ABOUT HERE

Once the immediate Rey-Osterrieth Complex Figure recall phase was completed, the participants were taken to another room in order to perform the remainder of the experimental tasks. Doing this permitted the testing of the effects of the MRC instructions, whilst eliminating the influence of actual physical reinstatement of context.

After the participants were settled in the new room, the experimenter read out the Crovitz-Schiffman instructions (adapted from Arnold et al., 2011b). The participants were asked to follow the computerized slide presentation which told them how to perform the recall of six memories. These six memories consisted of two memories from three different timeframes: one day ago, one week ago, and one month ago. The first slide gave the timeframe from which the memory was to be recalled and the cue word. The participants were told that the memory did not have to be based on the cue word but that it was there simply to help to bring a memory to mind. They were also asked to ensure that the memory was recalled from the timeframe given. The participants then wrote down their memory in the answer books provided. The timeframe and cue word remained on the screen during the writing phase. After three minutes, the participants were asked to stop writing at the end of the sentence that they were currently writing. The participants were then asked to complete the corresponding MCQ questionnaire for the timeframe. This process was repeated six times.

On completion of the sixth MCQ, the participants completed the delayed recall condition of the Rey-Osterrieth Complex Figure test.

The WAIS-IV information subtest questions were administered after the Rey-Osterrieth Complex Figure delayed recall phase with the experimenter reading aloud the questions to the participants. The participants wrote their answers in the answer booklet provided.

Finally, the participants were presented verbally with either the MRC instructions or the RE instructions and asked to recall information about the simulated crime event. As with the previous memory recall phases, the participants wrote down the details in the answer booklet and the same three-minute time limit was imposed on reporting details of the incident that they had viewed.

The participants were debriefed at the end of the experiment.

3. Results

3.1 Mental time travel ability

In order to determine whether there were differences in mean MCQ scores between the two interview conditions and the three timeframes used to elicit a generalized measure of mental time travel ability, a two-way ANOVA was conducted. There was no significant difference between the MRC and RE conditions in mean MCQ ratings, $F(1, 54) < 1$, $MSE = 2.610$, $p = .821$. There was also no statistically significant difference across the three timeframes in the MCQ scores obtained, $F(2, 108) = 1.58$, $MSE = 0.819$, $p = .210$. Finally, there was no significant interview condition x timeframe interaction, $F(2, 108) = 2.23$, $MSE = 0.819$, $p = .112$. The interview condition means for each of the three timeframes are shown in Table 1.

TABLE 1 ABOUT HERE

3.2 Eyewitness performance

The condition means for each measure of eyewitness performance are shown in Table 2. A multivariate analysis of variance (MANOVA) indicated that there was no significant difference in eyewitness performance between the two instruction conditions, Wilks' $\Lambda = .919$, $F(3, 52) = 1.53$, $p = .219$.

TABLE 2 ABOUT HERE

3.3 Multiple regression analyses

3.3.1 Intercorrelations between predictor variables

Overall, there were no significant correlations between either mean MCQ rating and WAIS-IV Information score, $r(56) = -.091$, $p = .506$, or mean MCQ rating and Rey-Osterrieth Complex Figure score, $r(56) = .056$, $p = .684$. However, there was a weak significant positive correlation between WAIS-IV Information score and Rey-Osterrieth Complex Figure score, $r(56) = .281$, $p = .036$.

3.3.2 Correct information

Standardized Beta-values and other regression statistics for each interview condition are presented in Table 3. The regression model did not significantly predict the amount of information correctly recalled for the RE condition, $R = .379$, adjusted-$R^2 = .037$, $F(3, 24) = 1.35$, $p = .283$. However, under the MRC condition, the predictor variables were significantly associated with the amount of information correctly recalled by participants, $R = .577$, adjusted-$R^2 = .250$, $F(3, 24) = 3.99$, $p = .019$. When the individual predictor variables making up the model were considered individually, only MCQ ratings was found to be a significant predictor in its own right. A scattergram of the relationship between MCQ ratings and the amount of information correctly recalled in the MRC condition is shown in Figure 2.

TABLE 3 ABOUT HERE

FIGURE 2 ABOUT HERE

3.3.3 Information incorrectly recalled

Again, the predictor variables did not significantly predict performance for the RE condition, $R = .063$, adjusted-$R^2 = -.120$, $F(3, 24) < 1$, $p = .992$. However, the regression model was found to significantly predict the amount of information incorrectly recalled by participants in the MRC condition, $R = .580$, adjusted-$R^2 = .253$, $F(3, 24) = 4.05$, $p = .018$. In this case, two of the three predictor variables were significant independent predictors of performance, namely MCQ rating (see Figure 3 for a scatterplot of the relationship), and WAIS-IV Information score (see Figure 4). There was no significant correlation between WAIS-IV Information score and MCQ rating for the MRC group, $r(28) = -.152$, $p = .441$.

FIGURE 3 ABOUT HERE

FIGURE 4 ABOUT HERE

3.3.4 Number of confabulations

The number of confabulations produced by the participants was so low as to render statistical analysis meaningless. As a consequence of this, no analyses are, therefore, reported.

4 Discussion

Individual differences in mental time travel (as measured by Johnson et al.'s, 1988, MCQ) significantly predicted the amount of correct and incorrect information that participants recalled about a simulated crime event. However, this predictive relationship was found only in the MRC condition and was not evident in the interview condition that was requested simply to recall everything they could about the incident. From this, it would appear that general mental time travel abilities are engaged when participants are asked to place themselves mentally back at the time of the event that they eyewitnessed. This does not appear to be the case when

participants are just asked to report everything that they can remember about the event. This finding would seem, therefore, to provide empirical support for the argument that, although both the RE and MRC components of the CI may lead to an increase in information, they do this by tapping distinct cognitive processes. As previously highlighted, the "Report Everything" instruction is likely to lead a witness to lower their criterion for reporting information (Milne & Bull, 2002), whereas the MRC instructions are likely to lead to more feature overlap between the encoding and retrieval environment (Wilcock et al., 2007).

Whilst it is important to note that a between-subjects design was used in the current study, there was no significant difference between the MRC and RE groups in their reported general levels of mental time travel, nor did their overall levels of eyewitness performance differ. Previous investigations which have also adopted between-subjects designs to compare the effectiveness of each component of the CI have, similarly, found no significant difference in recall between eyewitnesses who received MRC instructions and eyewitnesses who received RE instructions (Boon & Noon, 1994; Milne & Bull, 2002). Thus, the current findings replicate these earlier results. However, it is worth noting that Milne and Bull (2002) found that combining the MRC and the RE components led to significantly greater correct recall compared with eyewitness performance when tested on just one individual component.

Two factors should be borne in mind when examining the relationship between MRC and mental time travel in the present study. Firstly, participants were given a limited time of three minutes to write down what they could about the witnessed event. This time limit could, to an extent, have limited the amount of information recorded by participants. Future research should not limit the time period for recall and should require verbal recall of the witnessed event, thereby making the elicitation of responses more ecologically valid. Secondly, retrieval cues,

such as those provided by the MRC, are likely to be most effective when the memory trace is weak (Wilcock et al. 2007), as may occur with a longer delay than that used in the present study. During any delay, of course, participants may try to memorize the event in anticipation of having to subsequently recall what they saw; however, this is also likely to happen to many real eyewitnesses when they realize that they will be interviewed by the police.

In terms of the amount of incorrect information produced by the participants in the MRC condition, WAIS-IV Information scaled score (Wechsler, 2010) was found to be a stronger predictor than mental time travel. It is possible that this result might reflect the possible impingement of semantic information on recall (possibly in the form of scripts; e.g., Schank & Abelson, 1975), resulting in more incorrect details being produced. As is the case with many interventions designed to increase memory recall, the benefits must be weighed up against the disadvantages. Alongside any increase in the amount of correct information generated, there may well be a concomitant increase in the amount of incorrect information produced. For example, there is evidence to suggest that the use of the CI, whilst leading to a significant increase in correctly recalled information, also results in a small but significant increase in the amount of incorrectly recalled details (Memon et al., 2010). It is possible that those participants who had higher scores on the MCQ were better able to use MRC which, as well as leading to an increase in correct information, also led to an increase in the amount of incorrect information produced.

Mental time travel abilities were gauged by obtaining a generalized measure of the extent to which the phenomenological properties of the events recalled were re-experienced. Given the need for a generalized ability, a number of administrations of the Crovitz-Schiffman cue-word technique and its corresponding MCQ were required. Further to this, the use of six mental time travel episodes allowed a delay to be inserted between the simulated crime event and the recall of

that crime event. The presence of a delay permitted a somewhat greater level of ecological validity to the eyewitness recall, given that it is very typical for there to be some interval between witnessing an event and being questioned about it by an investigator. The tasks also served as unrelated, interpolated activities between encoding and recall as commonly employed in studies of eyewitness memory (e.g., Wilcock et al., 2007). However, concerns might be raised as to the extent to which participants got "fed up" with the repetitive nature of the six Crovitz-Schiffman and MCQ administrations and the potential impact of this on the results. There is no prima facie reason for this affecting one interview condition more greatly than the other; indeed, since the MRC condition places greater cognitive demands on the eyewitness (Dando et al., 2008), it would be expected that recall performance would be more affected in the MRC condition than the RE condition, as the participants might become disengaged with the study towards its end due to boredom and/or frustration. This was not evident in the results relating to eyewitness accuracy, nor were there reports or complaints from individual participants about this repetitive aspect of the study. In any event, the order of presentation of the six Crovitz-Schiffman tasks was counterbalanced to avoid order effects and, moreover, no differences in mean MCQ scores were found between the interview conditions nor between the three timeframes used to elicit mental time travel abilities.

Wright and Holliday (2007) have argued that mental context reinstatement is more easily achieved if an event is experienced first-hand, rather than being experienced in a video format. In the light of this concern, future work should seek to explore the role of mental time travel when live simulated crime events are employed (e.g., Searcy, Bartlett, Memon & Swanson, 2001; Valentine, Darling & Memon, 2007). If Wright and Holliday's argument is correct, then one would expect to see individual differences in mental time travel become an even more powerful

predictor of eyewitness recall if recall of a live event were to be elicited under MRC conditions. The use of a live staged event would also allow mental time travel ability to be tested directly using the MCQ, since it would be an episodic, personally experienced event in the way that watching a video is not. The event used in this study was brief in duration (30 seconds) and, whilst this is ecologically valid for a crime of its type, it would be interesting in future research to use a (live staged) crime with a longer duration. If the crime were longer in duration and were to contain more items to remember, there may be a greater opportunity for mental time travel to occur. Therefore, one might expect to see greater individual differences in mental time travel emerge under such conditions and for it to become an even more powerful predictor of eyewitness memory.

To conclude, the findings reported in the present paper indicate that individual differences in general mental time travel ability are related to the accuracy of eyewitness performance under MRC conditions but not under RE conditions. This is the first empirical demonstration that MRC instructions do actually seem to engage the mental time travel capacities that they purport to do. The finding that individual differences in general mental time travel ability predict eyewitness performance under the MRC indicates that some people will be better suited to the MRC component of the CI than others. This is an important point to consider when interviewing eyewitness, not only at the level of individual differences but also at that of group differences, and may limit the effectiveness of the MRC component in eliciting information about witnessed events.

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Footnote

[1] With this comes the risk of guessing at information. However, the Enhanced Cognitive Interview (Fisher & Geiselman, 1992) contains an instruction not to guess or make anything up.

Table 1:

Condition means for mean MCQ ratings over the three timeframes employed. Standard deviations are shown in parentheses.

	RE	MRC
One day ago	4.95	5.08
	(1.33)	(1.30)
One week ago	4.63	4.79
	(1.04)	(1.15)
One month ago	5.12	4.64
	(1.04)	(1.24)

Table 2:

Condition means for each measure of eyewitness performance. Standard deviations are shown in parentheses.

	RE	MRC
Information correctly recalled	17.07	14.71
	(4.53)	(5.13)
Information incorrectly recalled	2.25	2.54
	(1.62)	(1.75)
Number of confabulations	0.18	0.42
	(0.48)	(0.14)

Table 3

Standardized β*-coefficients and regression statistics for each interview condition.*

	Interview condition					
	RE			MRC		
Correct responses	β	*t*	*p*	β	*t*	*p*
Mean MCQ rating	-.206	1.08	.289	.458	2.65	.014
Rey-Osterrieth Complex Figure score	.256	1.25	.224	.152	< 1	.399
WAIS-IV Information score	.083	< 1	.689	.309	1.75	.092
Incorrect responses	β	*t*	*p*	β	*t*	*p*
Mean MCQ rating	.021	< 1	.920	.374	2.17	.041
Rey-Osterrieth Complex Figure score	-.044	< 1	.843	-.024	< 1	.894
WAIS-IV Information score	-.024	< 1	.914	.513	2.93	.007

Figure 1

A schematic diagram showing the time-course of the testing session.

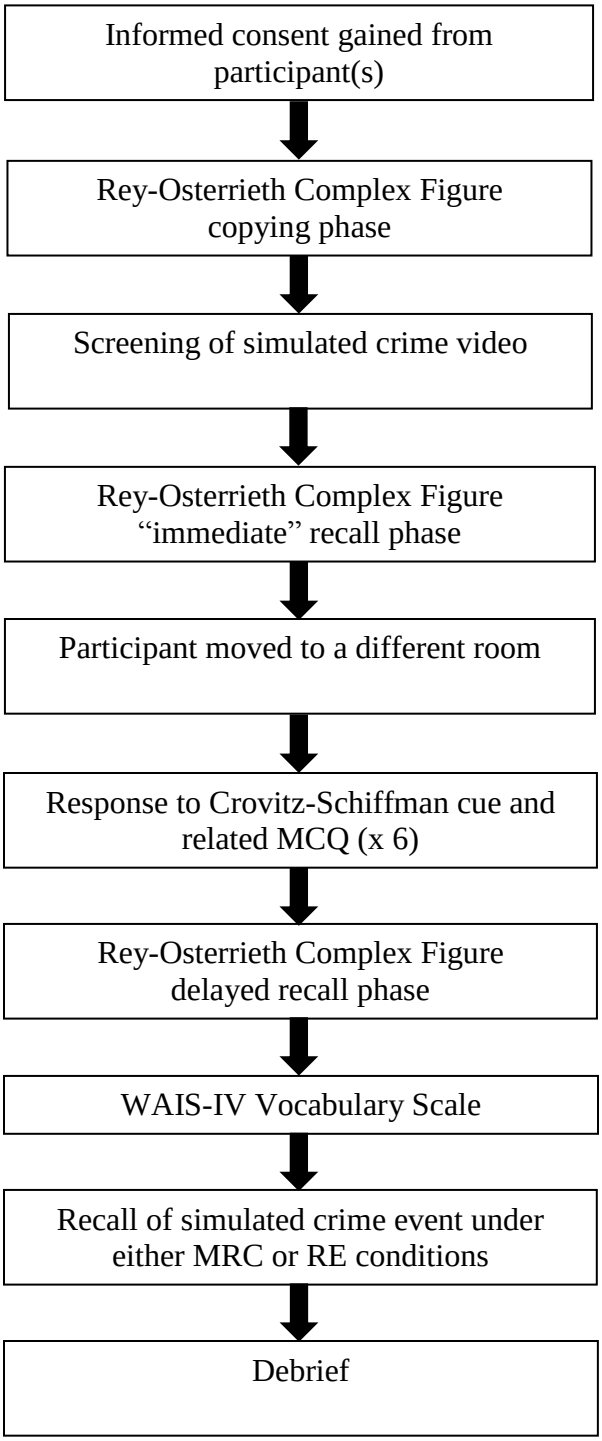

Figure 2

Scattergram of mean MCQ ratings of the MRC condition against the amount of information that they correctly recalled.

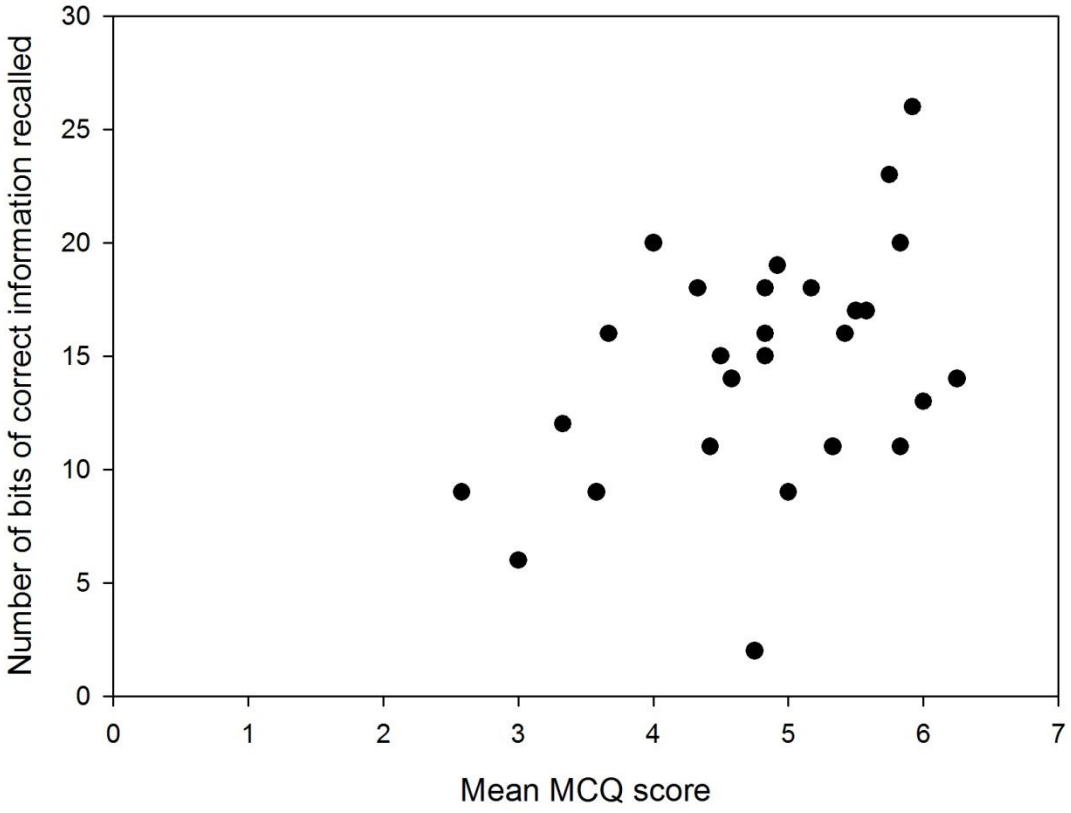

Figure 3

The relationship between mean MCQ rating and the amount of incorrect information produced in the MRC condition.

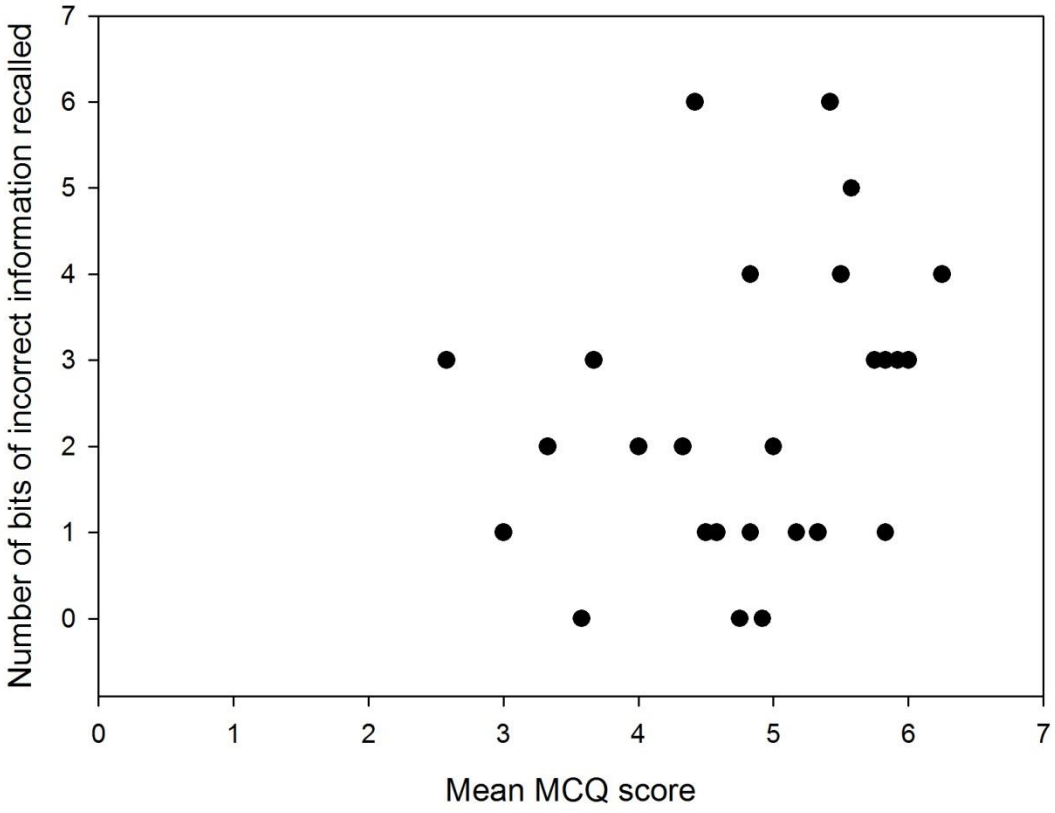

Figure 4

The relationship between WAIS-IV Information scores and the amount of incorrect information produced in the MRC condition.